

OS/2

A G A Z I N E

Reviews:

MESA 2 Spreadsheet
ZOC Communications
TechBridge Builder
IBM PL/I for OS/2

High-Res Graphics

MEET OS/2 WARP

How to take advantage of
the latest boards. Page 28

System Object Model

What you need to know
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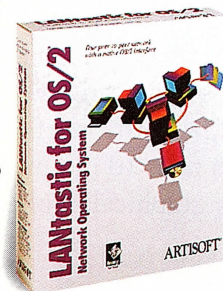
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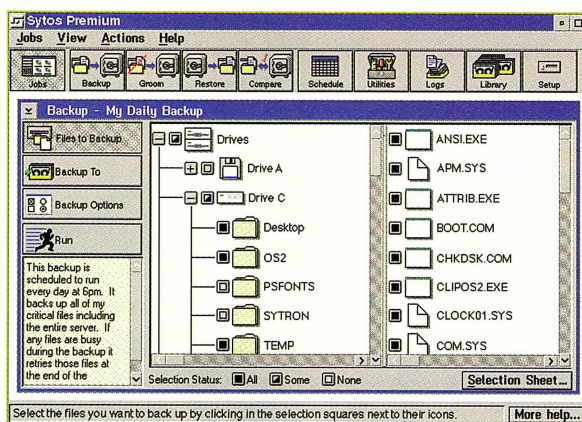
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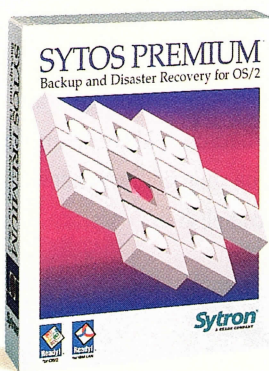
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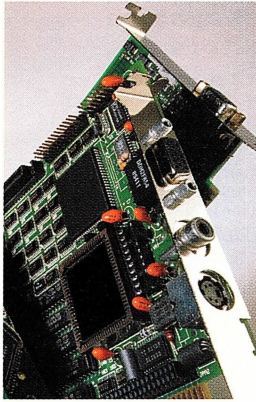
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April 1995



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Editor-in-Chief

Alan Zeichick

Executive Editor

Guy Wright

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Anne Mellinger

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David Bergeron

Senior Contributing Editor

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Contributing Editors

Dick Conklin

Dick Goran

Stan Kelly-Bootle

Mark Minasi

David Moskowitz

David Reich

Esther Schindler

Amy Wohl

Will Zachmann

Publisher

Ted Bahr

National Sales Manager

Catherine McConville

(415) 905-8115

cmconville@mfi.com

East/Midwest Sales Manager

Gary Ciocci (603) 924-9141

gciocci@mfi.com

Western Sales

Molly Knox (415) 905-8126

mknnox@mfi.com

Eastern Sales

Gordon Peery (603) 924-9141

gpeery@mfi.com

Advertising Production Coordinator

Jon Shurkin

Marketing Manager

Heather Chan

Circulation Manager

Sara DeCarlo

Assistant Circulation Manager

Jamai Deuberry

Newsstand Manager

Deborah Caris

Reprints

Andrea Ramiza (714) 499-2185

aramiza@mfi.com



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Boulder, CO 80323-6664. Telephone

(800) 765-1291.



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Electronic Mail

CompuServe mailboxes can also be reached through other electronic services. For example, the format is 76703.756@compuserve.com from the Internet.

Alan Zeichick	76703,756
or	zeichick@acm.org
Guy Wright	gwright@mfi.com
Alexander Antoniadis	71154,676
or	os2mag@mfi.com
Dick Conklin	76711,1005
Dick Goran	71154,2002
or	dgoran@netcom.com
Stan Kelly-Bootle	70323,1560
or	skb@crl.com
Mark Minasi	71571,264
or	mminasi@access.digex.net
David Moskowitz	76701,100
Brian Proffit	75300,1466
David Reich	76711,632
or	speedracer@vnet.ibm.com
Esther Schindler	72241,1417
Will Zachmann	76004,3657
Customer Service	71572,341

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OS/2 Magazine editors can be reached on the OS2AVEN forum on CompuServe. If you're not frequenting the various OS/2-related CompuServe forums, you're missing a user forum or OS/2 Magazine readers, writers, editors, and the entire OS/2 community to gather electronically. If you're a CompuServe member, you can visit the Forum by typing GO OS2AVEN at the command prompt. You'll be given the opportunity to join the forum. Go ahead—there's no charge beyond normal CompuServe rates.

To leave feedback for OS/2 Magazine editors, type GO MAIL and send electronic mail to the addresses listed above. Don't be passive! If you're not a CompuServe member, here's how to join:

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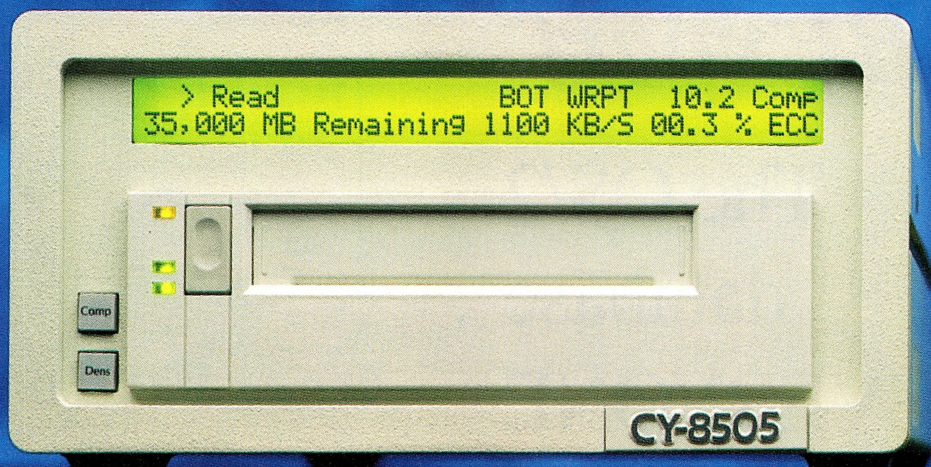
■ To find the number nearest you, dial 800-346-3247 with your modem (in Canada, dial 800-635-6225, voice only). When the modem connects, press Enter. At the Host Name prompt, enter PHONES. Follow the menus and note the number closest to you. Then hang up and dial the number you have just found.

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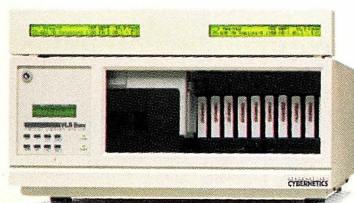
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Perspectives

Deep Blue

Back in January, I had the pleasure of spending a few days with many of the fine developers at IBM's Boca Raton facility. A more professional, talented, and dedicated group of programmers I've never met.

However, when I got back to my hotel, I discovered a floppy disk hidden in my briefcase, mysteriously labeled "Courtesy of Deep Blue." After popping it into my ThinkPad, I discovered the alpha-level executables for three never-before-seen OS/2 utilities. Wow!

You know, with OS/2 Warp's Win-OS/2, IBM's programmers have mastered the art of running 16-bit code in a 32-bit memory model. Clearly, the next challenge was to quadruple-thunk eight-bit code with OS/2. That's exactly what those enthusiastic, fun-loving programmers have done with CP/M-OS/2, an OS/2-hosted CP/M environment that offers near-perfect emulation, even to supporting most popular 8-inch floppy formats. There's even an Epson PX-8 Geneva emulation mode for laptop users!

Playing with VisiCalc and Perfect Filer in a seamless CP/M-OS/2 session, I could swear that I was back on a Kaypro 4, even to the annoying "kah-chunking" of the disks, and the overwhelming urge to repeatedly PIP my A> drive. Oh, those were the days!

IBM's Boca folks are pretty cagey about their plans for CP/M-OS/2—one official spokesman denied that it even existed! So, I can't tell you if CP/M-OS/2 will be sold in a special version of OS/2 Warp, or if it will be bundled in the next BonusPak. Perhaps CP/M-OS/2 will be an optional add-in. However, I *have* confirmed that the product's code-name is "Paklid," after those popular Star Trek: TNG aliens.

The second program on Deep Blue's disk was an early version of **TextReverser/2**, an amazing software achievement that offers unique text-manipulation and client/server database-lookup features. In its simplest mode, TextReverser/2 does what you'd expect, as the input *abcde* is output as *edcba*. But, when you use the correct switches, TextReverser/2 really shines. It can maintain proper text case, so that (for example) *Dead on Arrival* becomes *Lavirra no Daed*, which might mean something profoundly philosophical in Ancient Celtic.

You can activate Text Reverser/2's government-specification antonym converter, so *Black* can easily become *Etihw*—quite useful inside the Beltway. But what's most impressive is the tool's proprietary, arti-

ficial-intelligence-based, state-of-the-art ability to search external databases: With the proper resources, *Lou Gerstner* is swiftly transformed to *Namriahc S'mbi*, or perhaps *Thnemecalper S'reka*. The mind boggles at the possible applications!

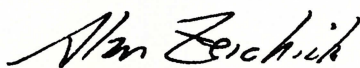
We all know it's generally unacceptable for independent journalists to take more than, well, dispassionate journalistic interest in any vendor's product, but it's our belief that, if properly marketed, TextReverser/2 will go far. So, we've taken the unusual step of unilaterally renaming the product, dumping its frankly uninteresting moniker in favor of a new name, "Schnauzer." Believe us, this puppy will go far.

Data compression is hot. You're probably familiar with file compressors like PKZIP, and disk compressors like Stacker and DCF/2, but did you know there's even a product called RAM Doubler? It's a Mac utility that claims to compress data stored in memory.

If what I've seen on Deep Blue's disk is true, IBM Boca Raton has gone light-years further with **CPU Doubler**, code-named "Zaphod Beeblebrox." (Isn't it nice they're getting away from Star Trek code names?) It's hard to believe, but CPU Doubler compresses threads and even individual microprocessor instructions on-the-fly to fool OS/2 for SMP into thinking that twice as many CPUs are installed. So, if you use one Pentium, Zaphod gives you two; if you have a four-486DX4 server, CPU Doubler gives you eight. What's most exciting is that, if you own an older PC, Zaphod still works great. Imagine the power of 386-based SMP, right in the privacy of your own home!

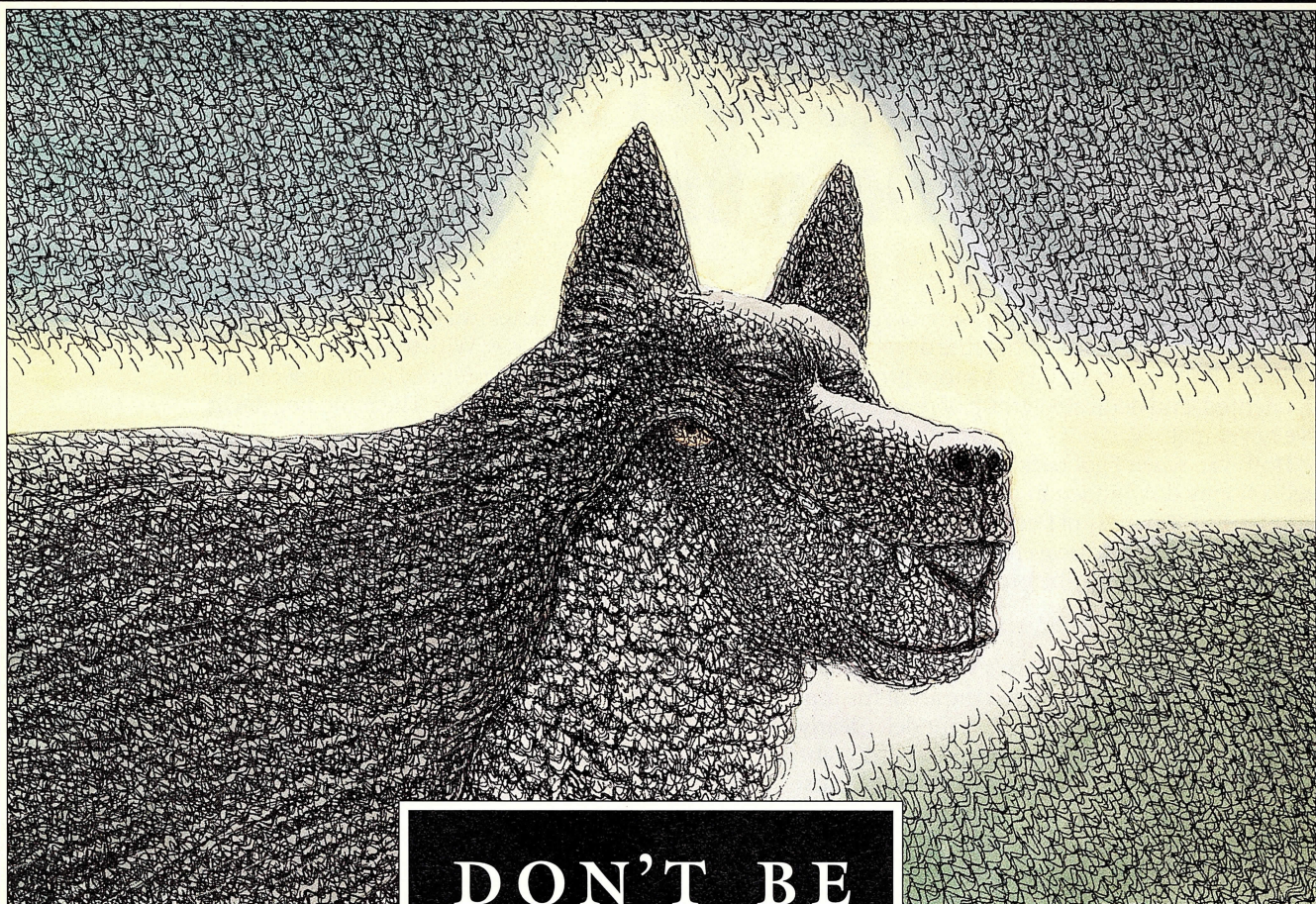
At least, that's the theory. At this early stage, CPU Doubler (at first, designed only for Pentium) doesn't work as claimed. Due to a baffling processor bug, the drivers can only achieve 1.9999999842:1 compression, which causes utter havoc with thread and task scheduling. But I'm confident that someday soon, Zaphod Beeblebrox will change the world as we know it.

The big question is: What else is hiding in IBM's Boca Raton labs? Perhaps we'll hear from Deep Blue again next April 1st.



Alan Zeichick
Editor-in-Chief





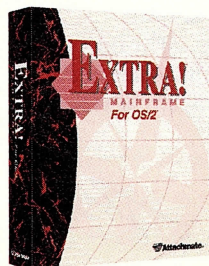
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Letters

Covering Windows Programs

Dear Editor:

Given how important backward compatibility is for many OS/2 users, I suppose that some coverage of Windows programs makes sense.

However, I hope that this coverage won't edge out any of the coverage of OS/2 programs. After all, Brian Proffitt's Test Drives column usually covers only two programs per month. There's a good number of OS/2 programs you haven't discussed, which (one way or the other) users should know about, and I'd hate to see them skimmed.

Besides, while Windows support is of short-to-medium term importance in OS/2 marketing, in the long term, OS/2 needs support for native applications. In my experience, most users consider DOS and Windows support a stopgap measure at best. After about six months, most users would prefer to switch to native applications if they can do so without much trouble.

Bruce Byfield

Bruce, surveys show that the vast majority of OS/2 users are running one or more Windows applications, so in our goal to help readers in all aspects of OS/2 use, it made sense to provide some coverage of Windows application tuning. As you've seen, the amount of space I give Windows applications is quite small, and I expect it to remain so. We wouldn't want it to crowd out OS/2 apps, right? And Windows applications won't always appear if the OS/2 programs fill all the space. I expect this to be the case in the April issue, for example.

Regarding the number of programs I test drive each month, the only way to increase the number is to decrease the amount of information I provide about the ones I do cover. By doing more than one program, I'm already trying to strike a balance between intense, detailed reviews that would take a whole column by themselves, and the short snapshots that appear in the New Products section. I think I have the balance about right,

but I'm always open to opinions.

Brian Proffitt

Warp coverage

Dear Editor:

Throughout the coverage of OS/2 Warp, your January issue stresses what IBM has done to make OS/2 easier to use. However, you left one important element out: the inclusion of Sources & Solutions in every package.

True, the book was outdated by the time OS/2 Warp was released. Any application released since last summer (and there have been lots of them) simply isn't in the book.

Backwards compatibility may be important for short-term OS/2 success, but native applications are important in the long run. Letting people know what is available and where to get it is especially important since OS/2 software is still not generally available in the stores. As far as I'm concerned, Sources & Solutions is a more important incentive to buy Warp than the Bonus Pack, and deserves a mention.

Bruce Byfield

It should also be noted that Sources & Solutions is also available by calling (203) 452-7704, or faxing to (203) 268-1075.

Quicken fix

Dear Editor:

On page 20 of the February issue of OS/2 Magazine, there is a note entitled "Windows Test: Quicken 4." Within that note are some instructions regarding how to obtain a fix to OS/2 Warp so that Quicken 4 will run in a Win-OS/2 session.

I have tried to follow these instructions. When I dialed the number (407-994-5544) to request APAR PJ13282, I was connected to an automatic call-switching system ("push 1 for..." "push 2 for..." and so on). I finally pushed the right buttons and was connected with a person. This person (who's name I don't have) told me that there was no record of APAR PJ13282. He suggested that I contact the IBM

BBS (919-517-0001) to download it from there.

I tried that, but met with no success. If there is such a fix and you're aware of it, I'd appreciate knowing where it is and how I can obtain a copy.

Tcoffey via the Internet

Dear Editor:

I called IBM at their (407) 994-5544 number and asked for the APAR Brian Proffitt quoted in the February issue of OS/2 Magazine. They really hassled me and basically refused to send it because they said it was an Intuit/Microsoft problem and not an IBM problem. They also said the APAR would not fix the problem.

Mike Meyer

IBM didn't want to send this out as a fix to OS/2 Warp. In fact, it is not available in that form now. To their credit, though, it doesn't change a line of OS/2 code. It is in fact a fix to Quicken. Anyway, when they decided not to make it accessible as an APAR, they packaged it up as the file qw4fix.zip which is available on the IBM BBS, the OS/2 libraries on CompuServe, and Intuit's BBS. One presumes it would be available somewhere from Microsoft as well, but I haven't been able to confirm that assumption.

Brian Proffitt

Errata

On page 55 of the February 1995 Just Announced section, the fax number for BT&T was incorrectly listed. The correct number is (714) 249-8346, and another order number is (800) 672-8293.

On page 20 of the February 1995 Test Drives section, the price of PMDMatch was incorrectly listed as \$25 which is the "direct mail check-only" price; the regular price is \$30 from BMT over the phone.

On page 56 of the February 1995 Just Announced section, the area code for SofTouch Systems was incorrectly listed. The correct phone and fax numbers are (405) 947-8080 and (405) 632-6537 respectively.

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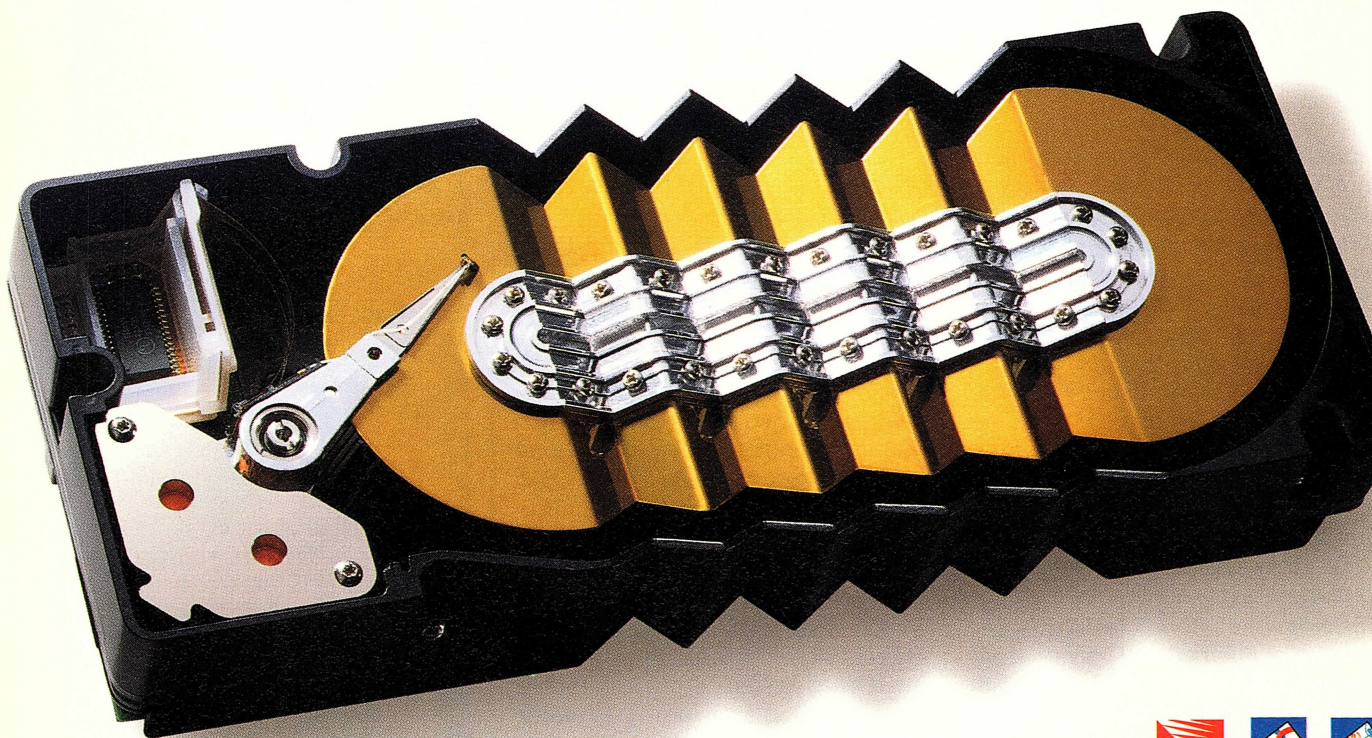
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Lotus and Kaleida

TALES OF CROSS-PLATFORM PROBLEMS AND SOLUTIONS

BY ALEXANDER ANTONIADES



Lotus won't run, until Windows 95 is done

When Microsoft announced, in late 1994, that Windows 95 would be delayed until August 1995 (or later), OS/2 users rejoiced. Knowing that many software vendors had already begun porting their Windows applications to 32-bit code, they expected to see a few "jump the gun," and bring out OS/2 versions earlier, not later. They certainly expected cross-platform developers (with both Windows and OS/2 code) to take advantage of Windows 95's delays to boost their OS/2 presence, and support their OS/2 customers. It should have been a happy story.

But then Yuko Takagi, Lotus Development Corp.'s Product Manager for SmartSuite for OS/2, posted a message on CompuServe's LOTUSA forum back in early January, explaining why the delays in Windows 95 mean delays for their OS/2 customers:

"...You want to know why Lotus won't ship the OS/2 SmartSuite now... In order to ship OS/2 now, months before the Win 95 version, I have two hypothetical choices.

- 1) Ship the equivalent of the Win 95 Suite on OS/2 today. This would give all our Windows competitors a look at EXACTLY what our Win 95 applications will look like, months in advance. That gives our competitors lots of time to rework their apps and outdo us, feature by feature. For obvious competitive reasons, it would not be a smart thing to do.
- 2) Fork off the OS/2 version, and ship something different on OS/2. This choice has the advantage of not tip-

**Now, we're not
unsympathetic to Lotus's
dilemma. But that's no excuse
for the highest-profile OS/2
third-party software
providers sitting back.**

ping our hand on the Win 95 apps. But the disadvantage is that it requires me to do away with the common code base strategy...."

Now, we're not unsympathetic to Lotus's dilemma. But that's no excuse for the highest-profile OS/2 third-party software providers sitting back, letting loyal OS/2 customers sit back with already outdated software.

Users of SmartSuite for OS/2 are already behind the times. Windows users have 1-2-3 Release 5 and Freelance 2.1. OS/2 users have the vastly inferior 1-2-3 Version 2.1 and "separate but equal" Freelance. Both of the Windows upgrades have been available for months. Not only that, but OS/2 SmartSuite users lack components found in SmartSuite for Windows, namely Approach (a database) and Organizer (a personal information manager).

OS/2 users have been willing to wait for Lotus to upgrade their SmartSuite applications, secure in the knowledge that Lotus would address the inequities

as soon as technically possible. Well, that trust has clearly been misplaced.

The last time OS/2 users were treated in this manner was by WordPerfect, which killed WordPerfect 6.0 for OS/2 19 days before code-completion. (See "The Big Good-Bye," Feb. 1994, p. 7). Despite WP's offer of OS/2 Workplace Shell Integration tools for WordPerfect 6.0 for Windows, the company never regained the trust of the OS/2 community. By directly, and cavalierly, telling OS/2 users that they're second-class citizens—and afterthoughts to their main business of selling SmartSuite for Windows 95—Lotus may have made a similar miscalculation.

If that's not bad enough, IBM's been marketing the SmartSuite for OS/2 on Lotus' behalf—instead of supporting vendors that have clearly shown more commitment to the OS/2 community. IBM spokesmen declined to comment on the Lotus news, but we wonder if it will affect the IBM/Lotus mixed-signal marketing agreements. After all, with friends like Lotus, why does IBM need to support other third-party software developers?

First public demo of Kaleida Media Player

One of OS/2's biggest weaknesses has been the lack of multimedia applications and development tools. It's clear that, if OS/2 expects to grow as a consumer operating system, it will need some mainstream multimedia titles and development tools. Once again, it seems that part of the answer will come from another Apple/IBM joint venture.

Kaleida Labs Inc. was founded in 1992 by IBM and Apple to develop an object oriented, operating system neu-

A photograph of Phil Jackson, a man with a mustache, wearing a dark suit, white shirt, and patterned tie. He is sitting on a basketball court, leaning back with his legs crossed and a confident smile. A basketball hoop and backboard are visible in the background. The scene is lit with a strong red light, creating a dramatic atmosphere. The text is overlaid in large, bold, white letters with black outlines.

PHIL JACKSON

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SINCE THE START

OF THE SEASON.



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basketball coach tries
to emulate the
winning ways of

Coach Phil Jackson, they

may want to take a peek inside his computer.

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some pretty neat things. Like use his computer
to review video
of last night's
game against

New York. At the exact same time that he's
e-mailing a respectful appeal to the League.
Of course, being a game day, he's also, at
the same time, using a Windows™ graphics
program to jot down plays.

They might also note that Phil never has
to worry about totally losing it (his programs,
that is) if an application ever goes down. And

that Phil can get on the Internet and other
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so he can get up-to-the-minute stats and
injury reports.

In short, they'd see that Phil has OS/2
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tral, multimedia layer on which applications such as games and presentations could be created. This buzzword-oriented concept is similar in many ways to another IBM/Apple joint venture called Taligent (see "Dateline: OS/2," February 1995, p. 11).

The foundation for this strategy is the Kaleida Media Player, which interprets programs written in Kaleida's ScriptX programming language, running them as soon as they are loaded. The advantage: new objects can be loaded while other objects are already running and the object-oriented nature allows new objects to be integrated into the program.

The first public demonstration of the media player (January 1995 at MacWorld in San Francisco) showed the potential for applications written using ScriptX. One of the examples was a tape-measure tool that was able to localize itself to recognize whatever dimensions were used in the program,

so it would measure in inches or millions of miles depending on the scenario. Other examples included animals that could interact with each other in any environment and a very impressive demonstration where ScriptX objects were retrieved via a Web browser and automatically loaded into the media player.

These demonstrations showed some of the power of Kaleida, but the jury is still out on how viable it will be in the near term. The biggest advantage: ScriptX is interpreted and not compiled. ScriptX objects are truly cross-platform compatible, so there's only one version to distribute. The downside is that, like all interpreted environments, there are performance concerns.

If ScriptX gains wide acceptance, it would be one possible scenario for OS/2 to gain equality with other operating systems in the release of mainstream multimedia titles. There's only one snag in this vision—there currently is

no Kaleida Multimedia Player for OS/2. It's only available for Macintosh and Windows.

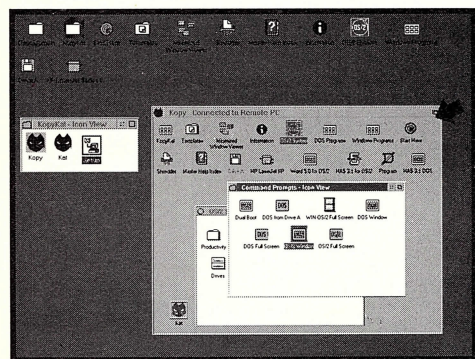
Kaleida is like most projects initiated pre-Gerstner. Then, IBM viewed OS/2 support as a low priority, but this attitude is changing. Kaleida has announced that the Media Player and ScriptX development tools will be available for OS/2 in the second quarter of 1995. It will happen in conjunction with the 1.1 update of the Media Player on other platforms.

Lately, IBM has made it a point to use OS/2 to spearhead all of its cross-platform initiatives, so perhaps Kaleida will be another project that puts OS/2 on the cutting edge. Hopefully, IBM will continue this trend with Kaleida, by not only keeping OS/2 current with other platforms, but maybe even by pushing it ahead. For more information about the Kaleida Media Player call (415) 335-2000 or fax (415) 335-2096.

KopyKat Remote Control Software

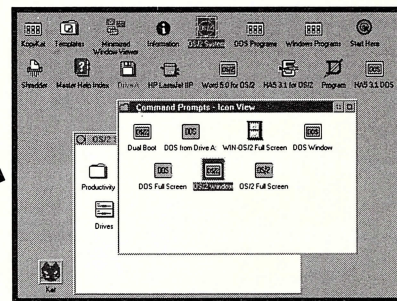
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The Importance of Software

IT'S THE APPLICATIONS, STUPID! BY AMY D. WOHL



From the amount of ink that has been spent writing about the Operating System Wars this year (and last), you'd think customers bought computers to run operating systems. In fact, while hardware without software is a cold dead brick, an operating system without applications isn't much better.

One of OS/2's problems has long been a lack of applications. First, IBM had great difficulty attracting developers to the platform. They were too busy writing for DOS, Mac, their own (pre-Windows) GUI interfaces, early versions of Windows, UNIX, or anything but OS/2. Then, IBM made two fatal errors.

Hyping non-existent software

First, they ran around and got commitments from independent software vendors (ISVs)—large and small—to the OS/2 platform. Then, they trumpeted loudly and printed vaporware catalogs and directories to be sure we could keep track of all the OS/2 software we could expect shortly. Experienced PC software developers knew what would happen next: Nothing happens on schedule in this business. Entrepreneurs' optimistic spirit overwhelms their business acumen when it's time to predict just how long it will take to bake the software cookies. It always takes longer than expected. What's worse, as time went on, Windows 3.0 neared the market and OS/2's fortunes waned as Microsoft lost interest and IBM took too long to recover, regroup, and get the next release out. ISVs decided that other platforms looked more alluring.

Writing OS/2 applications became unappealing, because you could sell to OS/2 users without having to maintain a separate development group.

Depending on Windows applications

In response, IBM came up with what seemed like a brilliant idea. If you couldn't get the developers to write OS/2 applications, and everyone wanted to run Windows software, IBM would let you run it better under OS/2. This idea backfired: It became really unappealing to write OS/2 applications because you could sell to OS/2 users without having to go to the bother and expense of maintaining a separate development group. The OS/2 market drooped even further.

Of course, some OS/2 software *does* exist—most of it in categories where OS/2 is important, like server applications, server-level systems management, and vertical applications. A good variety of OS/2 tools for applications development also exists, which has been good business because so many large shops have preferred to do in-house application development (for both servers and, in some cases, desktops) on OS/2. This practice has led to substantial vertical market software development by user

organizations, some of which has become generalized and augmented into commercial software.

The trouble is, OS/2's dependence on Windows as a source of mainstream software is about to find itself at a crossroads. OS/2 will not be Windows 95-compatible, which means new Windows 95 applications won't run under OS/2. It's not that OS/2 couldn't have been made to be compatible; IBM could buy Windows 95 code from Microsoft (just as it did with Windows 3.0 and 3.1 code under prior agreements, paying royalties to Microsoft for its use) and let the game continue. Except that, given the price of Windows 95 and IBM's volume levels (discounts for operating systems depend on volume), it would probably not be a profitable game for IBM. Microsoft has no reason to offer IBM any pricing breaks because OS/2 and Windows 95 (unlike OS/2 and DOS/Windows) will be direct 32-bit competitors.

IBM could offer OS/2 as a system that loads on top of Windows 95, but that requires that the user buy a copy of Windows 95 and load their own copy of OS/2. This strategy might work with existing customers, if the pricing strategy can be accommodated to be competitive (or IBM offers enough compensating goodies), but it's different with new hardware customers. Today, they tend to prefer pre-loaded software.

IBM and OS/2 have been given some breathing space as a result of the many delays in the release of Windows 95, which is now expected in August. IBM has several choices:

- Get the software developers to build more OS/2 software. It's a numbers

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gam. If enough OS/2 users exist, more OS/2 software will be created. The question is whether OS/2 can ever make numbers big enough to attract a critical mass of mainstream products. If it's ever to happen, 1995 will be the year. IBM has to make the big push for software *now* to get enough OS/2 software, not merely committed, but published, and thereby get the rest of the developers to join the parade.

■ Build development tools that create OS/2 and Windows 95 programs from a single development project with little, if any, additional work. Several projects are in place. The OpenDoc-sponsored project (which now has many more companies behind it) looks like the most promising one. Such tools would allow developers to offer an equivalent-feature OS/2 application for every Windows 95 program.

■ Decide that OS/2 is primarily valuable for servers and in-house development and concentrate on those areas. However, it appears that IBM has already decided to break out of this box and head for mainstream markets.

This year is critical for operating systems and applications software. New operating systems will ship, existing operating systems (OS/2 and Windows NT 3.5) will be enhanced, applications will be created and expanded, software companies will merge, new products will be announced, and some products will disappear. Amid all the noise and action, OS/2 is playing a much more central role. Newly revitalized by better features, performance, and much more attention by IBM marketing, OS/2 only needs more software that exploits its features to extend its stay in the marketplace and prepare for the battle with Windows 95 that will finally arrive later—exactly when, no one is sure, but it will be sometime this year.

Amy D. Wohl is president of Wohl Associates, a consulting firm specializing in office information systems, personal computing, and end-user computing. She is also editor of the Trendsletter, a monthly newsletter on computer industry trends.



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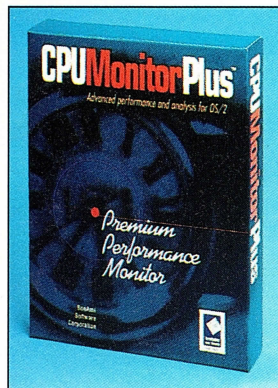
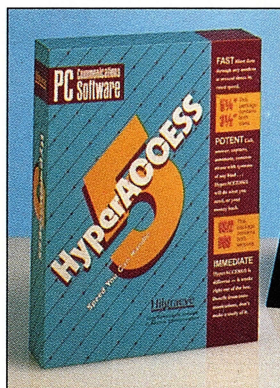
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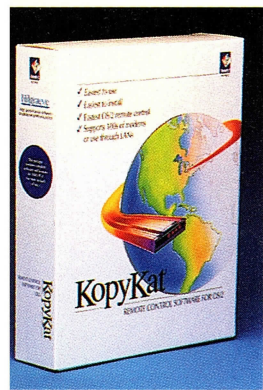
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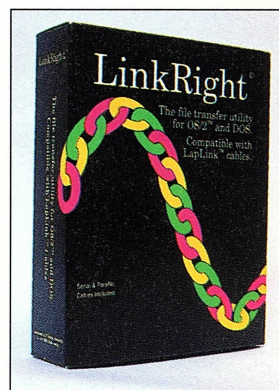


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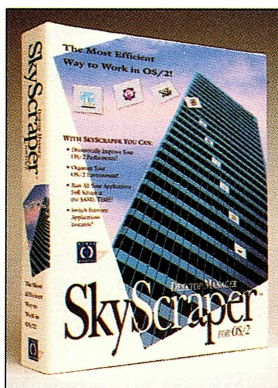
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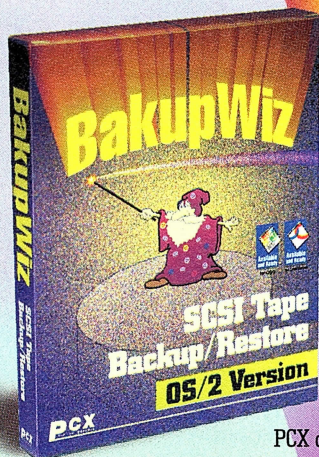
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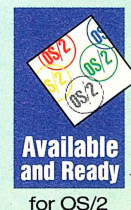
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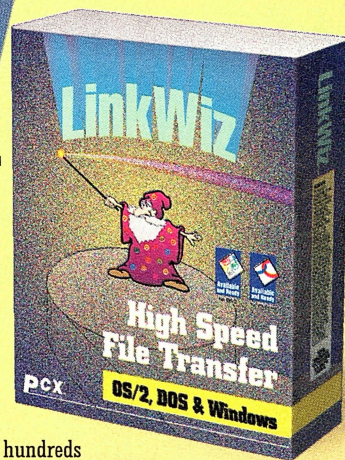
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Applications and the PowerPC

IBM NEEDS MORE THAN DOS AND WINDOWS EMULATION TO MAKE OS/2 FOR POWERPC A SUCCESS. BY WILLIAM F. ZACHMANN



OS/2 has done amazingly well for an operating system that, until recently, has not been pre-loaded on a very large number of systems and that has not had a particularly large assortment of native up-to-date state-of-the-art applications. With total sales fast approaching eight million after the past few years, OS/2 arguably holds the record for the most copies sold by an operating system without pre-loads or bundling with particular vendors' hardware. Even Microsoft Windows 3.x (which is only an operating system by a very loose and charitable definition of the term), independently of pre-loads and upgrades to pre-loaded systems, hasn't sold any more than that by most estimates. Only when pre-loads and upgrades are added does Windows approach the more impressive numbers that have so often been quoted by Microsoft and its supporters.

The fact that nearly eight million copies of OS/2 have been bought as independent purchases, despite a continued scarcity of native applications, is impressive testimony to IBM's efforts to deliver on the old "better DOS than DOS" and "better Windows than Windows" promises made back in the spring of 1991. While many users appreciate OS/2's ability to support full-function 32-bit multithreaded applications and look forward to using more of them in the future, most would not have been willing to make the switch to OS/2 if it did not have the ability, not only to run, but also to effectively multitask the 16-bit DOS and Windows legacy applications they already used.

For the most part, early adopters

used OS/2 2.0 and 2.1 as a better, more reliable, more robust, and more versatile platform to run the applications they already had (as did early adopters of Windows 3.0 and 3.1), not because of the immediate attraction of native-mode applications. Like Windows 3.x, OS/2 started to develop a serious and substantial applications base only after it was accepted by millions of users. Unlike Windows 3.x, however, OS/2 built its foundation base of nearly eight million users almost entirely by direct sales with very little help from pre-loads.

OS/2 did not need a broad base of native applications to get started, but native 32-bit OS/2 applications will soon be a crucial element in its future. OS/2's ability to run legacy DOS16 and Win16 applications well has, to be sure, been enough to get it off the ground. However, without the impulse of native OS/2 applications, OS/2 cannot gain sufficient momentum to establish itself permanently—let alone to break the barrier of market inertia. Even if OS/2 was targeted only for Intel-architecture systems, native applications would soon become increasingly important. PowerPC and OS/2 for PowerPC, however, make development of a broad base of native 32-bit applications for OS/2 even more crucial. This development is of growing importance to OS/2's future and the reason it must become an increasingly imperative priority for IBM.

IBM has done a good job to provide support for 16-bit DOS and Windows applications that were written for the Intel architecture with OS/2. However, IBM may not be able to repeat that with

equal success on PowerPC systems with OS/2 for PowerPC. IBM has publicly announced two different options for tackling this problem. The first approach to legacy applications support is software emulation of the Intel x86 architecture's instruction set on PowerPC systems. That is similar to the approach Apple took with the support of Motorola 68x0 applications on Power Macintosh systems based on PowerPC. Apple did well with that strategy, but only because of two favorable factors that are not likely to help IBM as much.

The PPC 601 chips that Apple used in the first Power Macs were significantly faster than the Motorola 68x0 processors that were used previously. The inevitable performance penalties of emulation still left the Power Macs to compare favorably with most, though not all, earlier 68x0 models. Even so, the early Power Macs were not fast enough to compare well with the fastest of the older models (for example, the Quadra 800 and Quadra 840av). However, during the next year or two, PowerPC chips are likely to face much stiffer competition from Intel and compatible chips. Software support for Intel object code on IBM PowerPC systems isn't likely to look very impressive by comparison to its performance on Intel-architecture systems.

IBM's second and quieter (so far) strategy is the rumored PowerPC 615 chip, which is said to incorporate microcode support for the Intel instruction set that directs the execution, in hardware, of the underlying PowerPC RISC processor. It will provide, we are told, hardware emulation of the Intel

The View from Canopus

architecture. Any such capability (assuming it sees the light of day at all) will necessarily come at some cost, both in RISC functionality or performance sacrifices and, very likely, in compatibility. I don't think it would be impossible for IBM to deliver such a capability, but I would doubt that it will be nearly as good as the real thing (execution of Intel object code on Intel or directly-compatible processors).

So, while backward compatibility and support for 16-bit DOS and Windows legacy applications were good enough to get OS/2 started on Intel-architecture personal computer systems, chances are that it won't get OS/2 for PowerPC very far on PowerPC systems from IBM and anyone else. For OS/2 for PowerPC to succeed, it needs a rich assortment of powerful native 32-bit OS/2 applications. Fortunately, prospects for that are looking better all the time.

After a very slow start, native OS/2 applications are finally starting to make a dent on the sales chart, albeit still a fairly modest one. Outfits like

Indelible Blue and Programmers' Paradise are seeing growing sales of OS/2 applications and tools. OS/2 applications are even finding their way into the local computer software stores. And, OS/2 games, like Galactic Civilizations, are starting to show on bestseller lists. With the on-going delays for Windows 95, more and more software vendors are giving OS/2 a serious second look and dusting off once abandoned plans for OS/2 versions of their applications.

It won't, however, happen by itself. IBM has made laudable efforts to encourage developers to write OS/2 applications, but they haven't yet shown sufficient commitment. It's time for that to change. IBM needs to take another hard look at what they are doing to support and encourage OS/2 applications development—both by independent software vendors and by in-house development groups. They need to make a 100-percent corporate commitment to see to it that developers have the tools, the support, the marketing assistance and

the customer exposure they need to be successful with native-mode OS/2 applications.

OS/2 for PowerPC will not be able to do as good a job supporting backward compatibility for DOS and Windows legacy applications as OS/2 for Intel Systems has done. It is precisely for that reason that the PowerPC offers a superb opportunity for IBM and software developers to show what can really be done with native OS/2 applications that fully exploit its fully preemptive multitasking foundations and use the power of the Workplace Shell as it continues to be expanded and improved. IBM cannot afford to miss this opportunity!

Will Zachmann, a well-known computer-industry analyst, is the founder and president of Canopus Research, based in Duxbury, Mass. He is also a former vice-president for corporate research of International Data Corp. You can reach him on CompuServe at 76004,3657, or on his popular CANOPUS forum.



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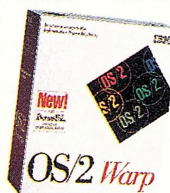
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Building PL/I

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TechBridge Builder 1.1

Jumbo shrimp. Military intelligence. Object-oriented visual COBOL. It just doesn't sound right, somehow. TechBridge Builder is the latest entry in the visual development category for OS/2. Builder distinguishes itself from the competition in a couple of areas. First, it is extremely object-oriented—almost to a fault. Diehard OO proponents will say that no such thing exists, but sometimes, worrying about things like classes, attributes, and schema is more trouble than I want to go through for a program. Still, the technology does give you the ability to develop black-box modules of tested objects and classes that are easy to reuse. Once you have a library of them put together, it is very straightforward to develop new variations.

Second, the language that is used to assign code to events is based on COBOL 85 (with Smalltalk undertones). A statement to load and display a spin button might read as follows:

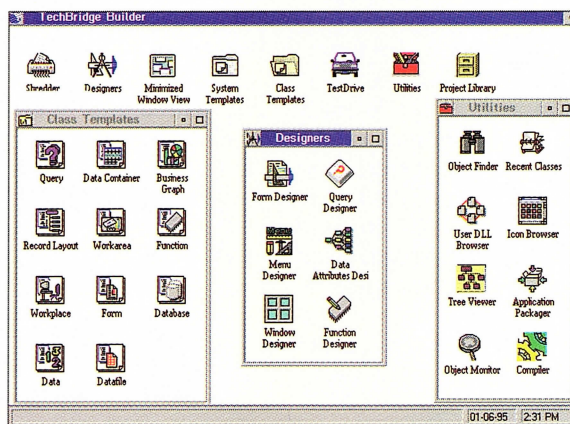
```
01 spinvalues.
03 filler pic x(3) value '20'.
03 filler pic x(3) value '40'.
03 filler pic x(3) value '60'.
03 filler pic x(3) value '80'.
03 filler pic x(3) value '100'.
call SpinFactor::setContents
using spinvalues.
```

Builder has a marvelously succinct *readme* file: "The user manuals and on-line help are current and up to date." Unfortunately, that's not quite accu-

rate. TechBridge used Smalltalk V/PM to develop Builder and you'll need the Smalltalk fix from Digitalk to make Builder work on OS/2 Warp. By the time you read this, the fix should be out in an updated Builder 1.1.2. The fix is also available from Digitalk's forum on CompuServe. Because it's in a private library for registered Smalltalk owners, you'll have to send the sysop a note and wait for approval to get access.

Not for entry-level systems

TechBridge Builder has a relatively hefty appetite for memory, but it's not unreasonable for the number of functions it performs. Still, even a fairly small project took more than 7MB to load and perform simple actions. Larger projects could lead to heavy swapping and performance hits unless you load up on physical memory. In addition, your applications will need a sizable run-time environment. TechBridge was, however, generous in their licensing. For a one-time fee of \$100, an enterprise is allowed unlimited copies of the run-time module.



Developers will need systems that have display resolutions of more than 640x480 to use Builder well. Many of the windows pop up almost completely off the screen at that resolution. You'll need to remember <Alt+F7>, the keystroke that allows you to move windows when you can't see the title bar.

Visual development

Development is largely a matter of creating classes and defining relationships between those classes. As you do, you attach

code to the components of these classes. I like the incremental compile function. It allows you to perform a compile (remember when we used to spend hours reading code to do a syntax check?) on the code that is assigned to a specific form without having to recompile the entire project. Compilation is a relatively slow process, but that's not surprising for a visual tool. What's surprising is that you need to compile at all. Considering that the large TechBridge Desktop environment has to be installed on every system that will run your application, you'd think the program would be entirely interpreted. The interim pseudo-code that is generated, though, is a bit faster than you would get from a totally interpretive environment.

Class templates are included that make it easier for you to create your own databases and generate queries against, or reports and graphs from, those databases. The business graphs template is especially handy. It uses SQL calls as the front end to a series of graph types including horizontal and vertical bars, stacked bars, area graphs,

line graphs, and pie charts. Three-dimensional versions of these graphs are also available.

The forms designer is a straightforward palette of controls that can be painted onto a form. What makes it even easier, however, is that when you associate a form with a data class, the forms designer can automatically generate prompt and entry fields for the fields in that class. In other words, much of the basic form design work is automatic.

Builder goes beyond these basics of graphical development to provide better OS/2 integration. For example, links make it easy to develop context-sensitive help through OS/2's Information Presentation Facility (IPF). The integrated debugger is easy to use and includes automatic tracking of variables, breakpoints, single-step mode, and the other basic features you expect from a modern debugger. It takes advantage of COBOL's structure by allowing you to step from paragraph to paragraph or trace within paragraphs. Animation is another nice feature. It allows you to run the program at slower speeds so you can track the progress without having to continually hit the step or trace buttons.

It should be noted that during testing, I managed to lock up the system twice, with OS/2 generating the infamous "program is not responding to messages" error. Telling OS/2 to cancel the program didn't help. I had to reboot both times, which wouldn't have surprised me if I had generated the underlying window procedures myself, but because those procedures are part of the TechBridge development environment, they get the credit for the bug.

Access data anywhere

When you put a sizable run-time environment together with heavy object orientation, large memory requirements, and COBOL, you come rapidly to the unmistakable conclusion that this product is aimed squarely at the corporate environment. Actually, a glance at the \$2,580 price tag makes that pretty clear. It should be no surprise that, in addition to PC-based DB2/2 support, Builder includes functions to access mainframe DB2 databases. The idea is to try to ease COBOL developers into the client/server envi-

ronment. SQL support is embedded into the language, making SELECT statements an integral data-access tool.

Glee or flee

Clearly, this product has a lot of features. The User's Guide weighs in at approximately 600 pages and TechBridge deserves special recognition for binding it in such a way that it easily stays open to any page. I wish more vendors were as sensitive to the way people used their products.

The question is, what is the target audience for this product? If it is intended for mainframe COBOL users who are moving to client/server, as TechBridge states, how many of them have flipped their minds over to the vastly different object-oriented programming paradigm? It's a less drastic mental transition to go to the Micro Focus COBOL/2 Workbench. If the target is OO lovers, how many of them want to code calculations with COBOL statements like:

```
Multiply Income by TaxRate
      giving Tax
```

instead of:

```
Tax=Income*TaxRate
```

TechBridge Builder is actually a nice product and does make development of Presentation Manager business data applications more easy and straightforward than conventional high-level languages. If you're a COBOL programmer looking for object-oriented development experience, TechBridge Builder is a good way to get it.

PL/I for OS/2 1.1 and PL/I for OS/2 Toolkit 1.1

When it was first released by IBM in the 1960s, PL/I was ballyhooed as the one programming language that satisfied all needs. By combining the record orientation and structures that COBOL offered business programmers with the easier numeric/scientific calculations of FORTRAN, PL/I remains one of the best general-purpose languages available. But, because of that all-purpose nature, PL/I didn't take over the development world as was expected. Business coders tended to prefer the business-oriented

COBOL, the number crunchers stayed with FORTRAN, which was designed for them, and the bit twiddlers stayed with assembler or, later, C.

All programmers would benefit from a familiarity with PL/I. No matter what other languages you use, the time will come when you will have to perform an unnatural act to make the language fit the task. When that happens, it would be much easier to pull PL/I out of your hip pocket than go through strange gyrations to make your main language handle the job.

Roots through a raised floor

The area of the computing industry that has embraced PL/I most thoroughly is the land of mainframes. IBM did not lose sight of that fact when they developed the OS/2 version. PL/I for OS/2 is part of IBM's SAA AD/Cycle family of products. If you aren't in the mainframe world, you probably don't know what that means. However, people in the glass house environment know that the System Access Architecture is an attempt by IBM to allow common programming across its hardware line. Programs that are written to the SAA subset of the PL/I language can be recompiled with little or no change on OS/2 as well as its mainframe OS and AIX counterparts. But, by the way, the differences in the operating systems and file systems bring some interesting by-products. Anyone who is accustomed to OS Job Control Language will probably think nothing of adding statements like `SET DD:SYSIN=CRG.INP,RECSIZE(30)` to their `config.sys` file. Thankfully, the rest of the world doesn't have to care.

Numerous extensions to PL/I are specific to the OS/2 or OS versions of the language, but they are clearly marked and avoidable. You're more likely to have compatibility problems between OS/2 and the mainframe through the more subtle assumptions that are based on the hardware instead of the language. For example, the mainframe stores information in EBCDIC format, while the PC uses ASCII. It's not uncommon for PC programmers to embed the characters in their program to move the screen or a report to a new line. However, the hexadecimal string `0DOA` doesn't perform a carriage return/line feed on the mainframe and your output won't be formatted correctly. (Printing

Test Drives

a 1 in the first position of a line will not cause a page eject on the PC, which it would in mainframe programs.)

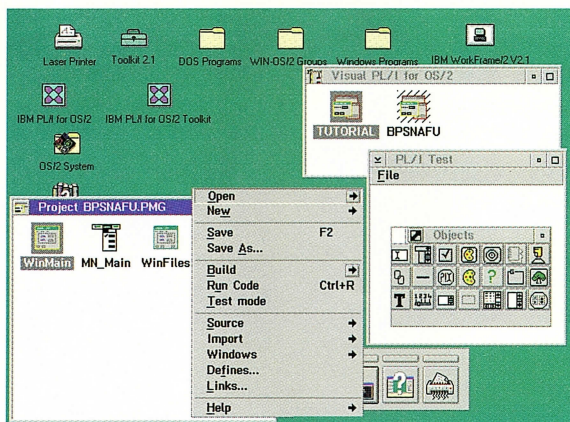
The collating sequence is also different. So, when you compare text, a is less than A on mainframes, but not on the PC, which can wreak havoc on sorting routines. To help you through such problems, IBM devoted a chapter in the Programming Guide to these issues and their workarounds.

Mainframe legacy is good news

The fact that PL/I for OS/2 is a transplant from the mainframe environment should not be construed as a disadvantage. IBM has been producing and improving PL/I compilers, literally, for decades. This product shows the maturity and optimization (not to mention support for VSAM files) that comes from that experience.

Because many PL/I users on mainframes write programs to process infor-

mation in DB2 databases, it's no surprise that IBM offers a Professional Edition of PL/I for OS/2 that includes a SQL preprocessor to allow you to embed calls to DB2 databases in your PC programs. The Professional Edition also contains a CICS preprocessor that makes it an excellent PC development environment for mainframe-based applications that use System 390 CICS, as well as for PC-based applications that use CICS OS/2.



Truly an OS/2 product

The OS/2 version of PL/I contains nearly 100 new built-in functions. IBM added support for multitasking with the new ATTACH statement. A thread ID is returned that can be used in all standard OS/2 thread APIs. In addition, a WAIT THREAD statement helps with synchronization across tasks. It is a 32-bit compiler, but it includes 16-bit linkage options. PL/I routines can call (and be called from) C and REXX programs. The calls can also be dynamic with full DLL support provided.

A full set of include files offers complete access to the OS/2 2.x API. But, that means that MMPM/2 and the new DIVE functions aren't supported directly. You can, however, use the C2PLI tool in the Toolkit to convert the MMPM/2 and DIVE headers for C to PL/I include files, in addition to any other C (but not C++) header files.

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Experienced OS/2 programmers will find that PL/I programs look an awful lot like Presentation Manager (PM) programs written in any other third-generation language, complete with anchor block handles, window procedures, and message-handling routines. Let's face it, calls to **WinCreateStdWindow** will look pretty much the same, regardless of the language. The main difference is the convenience of the PL/I constructs in the non-GUI-related sections of the program.

Well, mostly...

If you're accustomed to using a separate programmer's editor and shelling out from there to compile and link, PL/I for OS/2 will feel familiar. It is not, however, the integrated development environment that most PC-based languages now offer. No code editor is included, so an automatic selection of lines will contain compile errors.

On the other hand, the debugger is windowed, which makes it easier to trace program flow while watching field values. Unfortunately, the debugger can't be used on graphical programs! The inability to debug graphical applications is a serious limitation if you're using PL/I for PC-based programs, but isn't as important if you're using the PC as a development environment for mainframe programs.

The non-integrated approach is consistent with IBM's development philosophy. Instead of imposing a certain development environment, their goal is to provide a framework into which you can plug your favorite tools. **WorkFrame/2**, which is included with PL/I, is the glue that pulls together various components, using the facilities of the Workplace Shell (WPS). **WorkFrame/2** helps you organize the pieces of your projects in containers and add appropriate entries into their pop-up menus. Once you have created profiles with the parameters you would have used from the command line, you can add entries, for example, **Compile**, **Link**, **Browse**, **Debug**, and **Edit**, to your modules' pop-up menus and perform these common functions with a simple mouse click.

What should have been a great idea is hindered by the **WorkFrame/2** Guide that is included with PL/I. The cover of the book indicates it is for version 1.1. Opening the book reveals that it is for version 2.1. Or is it 1.3? Actually, it

appears to have sections for each. Instead of rewriting the book for version 2.1 (which is included with PL/I, so they should have been able to predict that you had it), they added new sections to the front of the book on ver-

sion 2.1. The intrepid developer begins with the introduction on p. 1, springs forward to p. 39 to learn the basics from the 1.3 documentation, and trudges back to p. 17 to get the rest of the story. Try not to let that scare you off.

IBM to English Dictionary

In our continuing effort to break through the confusion that sometimes comes when dealing with International Business Machines Corp. employees, we offer the following translation tips:

APAR	Authorized Program Analysis Report (pronounced AY-par), sometimes incorrectly called an Authorized Problem Analysis Report. Once technical support has determined that you have found an actual bug, they'll give you an APAR number to track the bug through the fix cycle.
Escalation	Going over somebody's head. If you think somebody made a stupid decision, you escalate them by asking their boss to change it.
Hardfile	The spinning thing in your computer that stores multiple megabytes of data. Everyone else calls this a hard disk or (more rarely) a fixed disk.
LOB	When you run out of Divisions, Regions, and Groups, you create a Line of Business or LOB. When IBM reorganized the Entry Systems Division out of existence, they created the Personal Systems Line of Business, whose members were affectionately known as P-SLOBs.
<PF2>	A program-function key, which is a holdover from mainframe 3270 terminals. You may hear an IBMer tell you to press the <PF2> key, which doesn't exist. If you remove the P, it's clear that they're referring to the <F2> key. (This is different, of course, from <PA2>, which is a program-access key that is found on a different part of the 3270 keyboard and has no native PC equivalent.)
Planar Board	Archaeologists surmise that this misnomer for "motherboard" refers to the fact that the motherboard itself rests in one plane, while the adapter cards plugged into it are at right angles to that plane.
PROFS	PROFS is IBM's worldwide electronic-mail system for use by employees and contractors. Gateways exist between PROFS and the Internet, but most IBMers don't know how to access them. PROFS stands for Professional Office System.
Pushback	Complaints. "Let's try this idea and see if we get any pushback."
Tie line	An internal telephone network that allows all domestic and many international IBM locations to call each other directly instead of using normal long-distance channels. An IBMer will always volunteer to give you his or someone else's tie-line number, knowing that non-IBMers can't call it.

Do you know of any additional examples of IBM-Speak? Fax them to *OS/2 Magazine* at (415) 905-2499 or e-mail to CompuServe 76703,756, or Internet os2mag@mfi.com.

Test Drives

WorkFrame/2 really is a good idea and it's worth the trouble to learn.

Making PL/I GUI

Other than the C2PLI header-conversion tool, the main component of the PL/I for OS/2 Toolkit is Visual PL/I. This tool is basically a graphical code generator that allows you to interactively lay out the PM components of an application and generate the PL/I code to animate those components. It includes support for creating on-line help and for creating libraries of reusable code. Visual PL/I is a product that deserves a separate review in its own right, along the lines of such indispensable tools as Kaseworks and Gpf for C programmers. For Visual PL/I alone, anyone using PL/I for OS/2 should consider the companion toolkit a must-have for fast PM development and prototyping.

Glee or flee

C proponents will argue that PL/I programs don't execute as quickly as C programs, and REXX developers will argue that PL/I programs aren't as easy to write. Such statements are accurate, but they aren't as true as they used to be. PL/I for OS/2 plus the Visual PL/I front end combine to make an excellent general-purpose development platform.

Turbo Pascal for OS/2

I would really like to be reviewing Turbo Pascal for OS/2. Unfortunately, Borland isn't shipping one.

Brian Proffitt has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become director of PC Week's Corporate Labs, and is now president of Visionary Research. Brian is the author of two books on OS/2 and Senior Contributing Editor for OS/2 Magazine. He can be reached via e-mail at 75300.1466@compuserve.com.

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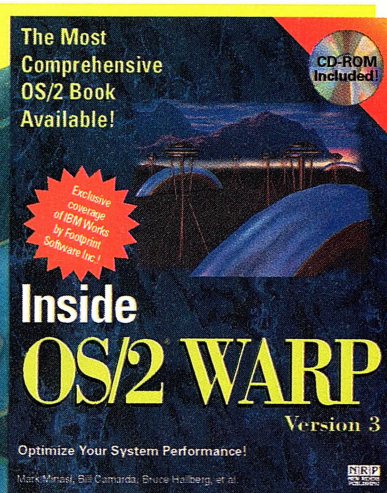
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Reader Service No. 16

Configuring graphics subsystems for OS/2 Warp with fewer headaches and crashes.

BY LENNY BAILES

High Resolution Graphics

Many OS/2 veterans agree: Installing and configuring high-resolution graphics displays is considerably easier with OS/2 Warp 3.0 than with OS/2 2.x. One good reason is that OS/2 now includes support for many more graphics cards and SVGA chipsets right in the OS/2 Warp package. Another reason is that OS/2's installation process has been modified to detect and configure graphics hardware automatically—if you're the lucky owner of a supported graphics board. Unfortunately, there are still many, many popular graphics cards not directly supported by OS/2 Warp. What's more, the state-of-the-art in graphics adapters changes on a month-to-month basis. The faster card that you bought today from a third-party vendor may not be able to use drivers built for that manufacturer's earlier cards.

OS/2 Warp is better than its predecessors at managing high-resolution displays, but there are some important configuration issues and "secret tricks" you won't find in the OS/2 documentation. One of OS/2 Warp's most valuable new features, the ability to recover the desktop after an abortive graphics upgrade, is covered only superficially in the manual. And sometimes, it just doesn't work! In this article, I'll try to give you the information you need to deal with non-supported graphics cards, change the configuration after OS/2 has been installed, and recover from unexpected program crashes.

Installing drivers

New display drivers can be installed in OS/2 in one of two ways. The Selective Install object (located in the OS/2 System Setup folder) is used to select an OS/2 Warp-supported, built-in display driver. The DSPINSTL utility (located in the *os2\install* directory) is used to install third-party drivers from a vendor-supplied floppy disk or hard-disk directory.

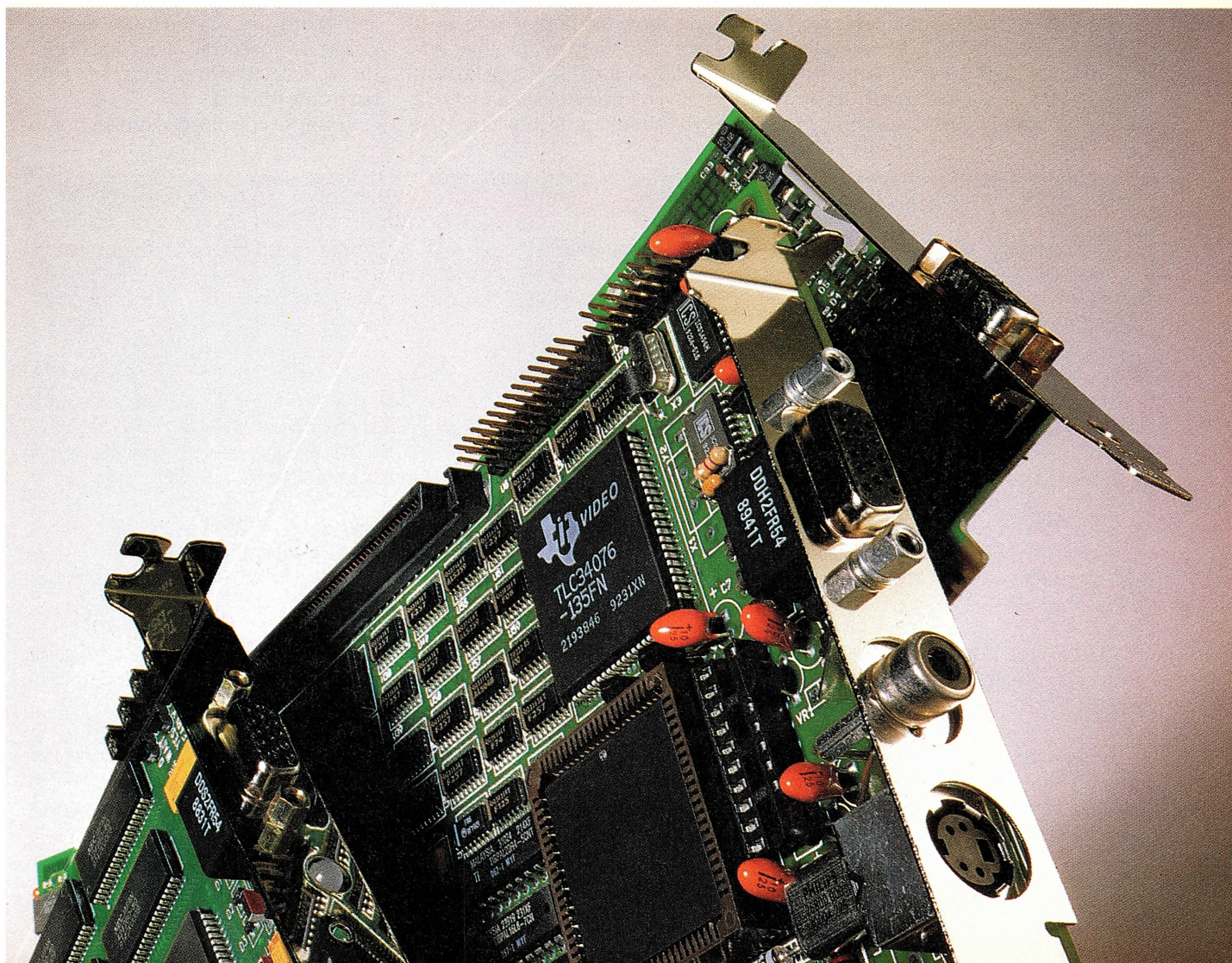
Running either Selective Install or DSPINSTL causes the OS/2 System Configuration screen to appear. (The System Configuration screen also shows up during the initial OS/2 installation, if you selected Custom Install.)

Clicking on Primary Display in the System Configuration screen brings up a list of OS/2-supported graphics displays. If you reached this screen through DSPINSTL, then some additional third-party drivers are added to the list. Table 1 lists the display modes and third-party graphics boards directly supported by OS/2 Warp 3.0 "for Windows." OS/2 Warp "full-pack" (with Win-OS/2 support) might include a longer list of

devices.

If your graphic display is on the supported list and you choose the Easy Install option, OS/2 detects it automatically and installs an appropriate driver set. Your graphics card may be absent from this list, but still supported. Orchid Technology, Diamond Computer Systems, and other vendors make cards that share the same chipsets as OS/2's listed displays. Other companies, such as ATI Graphics, make cards that can use more than one of the supported display types. Sometimes, you may want to override the automatic detection feature to choose a more versatile display type.

If OS/2 doesn't detect your display card type automatically (and send you a warning message to this effect), the documentation supplied with the card may recommend which SVGA chipset to select. The Diamond Speedstar and Speedstar Pro, for example, use the Cirrus Logic 5426 and 5428 drivers. The Speedstar Pro SE uses the Cirrus 5428 driver, and the Speedstar Pro SE 64 uses the Cirrus 5434 driver.



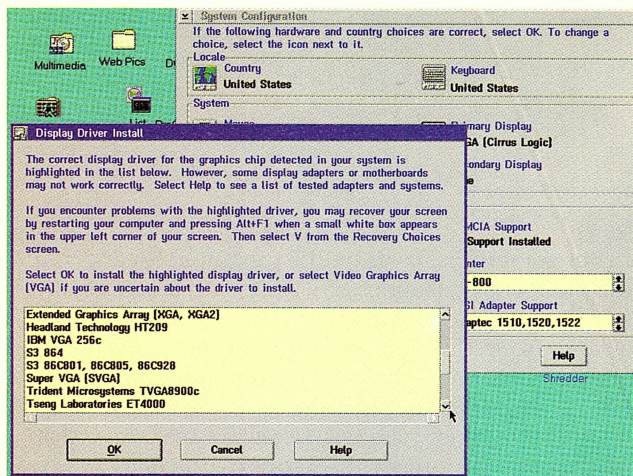


Figure 1: After you start Selective Install, double-clicking on the Primary Display option brings up a list of displays and drivers with built-in OS/2 support.

The Diamond Stealth 64D uses the S3 864 driver. The ATI Graphics Ultra defaults to an installation with the ATI Mach 8 drivers, but works more efficiently if you choose the Display Adapter 8514/a option

Not all popular graphics cards are directly supported by OS/2. If yours isn't in the list, OS/2 will usually default to a lowest-common-denominator 640x480x16 color VGA installation.

Finding third-party display drivers

If your graphics card doesn't support one of the driver configurations in OS/2 Warp's list, the board's manufacturer may have provided floppy disks with drivers for OS/2 Warp or an earlier version of OS/2. If the third-party board's drivers haven't been updated for OS/2 Warp, you should probably look for a

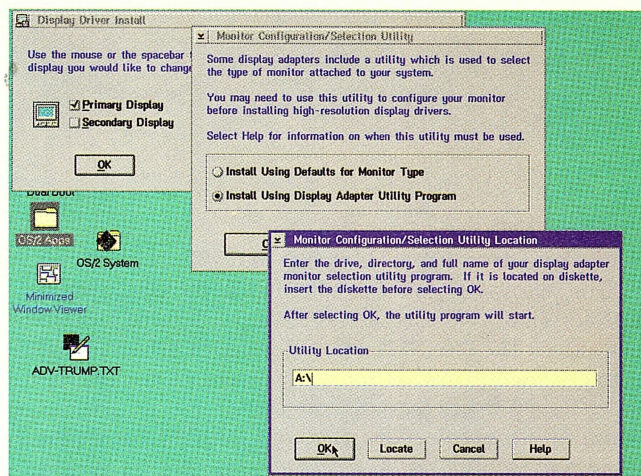


Figure 2: For most VGA upgrades, OS/2 gives you the option of automatically adjusting the monitor scan rate or allowing you to run a special monitor-configuration utility. If you decide to run a custom utility, the default procedure is to specify the path and program name for a disk inserted into floppy drive a:\.

new version. Typically, current display drivers for OS/2 Warp can be downloaded from CompuServe, the IBM bulletin board, or a BBS run by the display-card vendor (generally your best bet for the latest device driver, if it's been written by the vendor).

If you've downloaded drivers from a

Five Headache-Prevention Tips

1 Set Windows to VGA: If OS/2 Warp wants to use ordinary VGA drivers, you should probably allow the installation to finish before attempting to upgrade to a higher resolution—don't attempt to plug in a third-party driver during the initial setup procedure. If you are installing to a system that already runs Windows, you can also avoid problems by resetting Windows to "generic VGA" before starting the OS/2 installation. To reset Windows' graphics, boot a DOS session and run the *setup.exe* utility in the *\windows* directory.

2 Synchronizing Windows disks: If Windows was installed on your machine over a network or by the hardware vendor, it may have been set up with a different set of floppy disks than the ones that you have in your Windows package. This becomes apparent during an OS/2 installation, when you're continually prompted to insert the wrong Windows floppy disk in drive a:\. To avoid this situation, you can synchronize the version of Windows on your hard disk with your floppy source floppy disks. To do this, look for a file called *setup.inf* on your first or second Windows floppy disk. Copy *setup.inf* from drive a: or b: to the *\windows\system* directory on your hard disk. This will ensure that OS/2 prompts you for the correct floppy disks during the installation of Win-OS/2 support.

3 Set to VGA Before Upgrading: If you intend to switch to a new graphics adapter or third-party driver set after OS/2 has been installed, it is a good idea to reset the desktop to the generic 640x480x16 VGA display before proceeding. You can do this by running the Selective Install feature from the OS/2 System Folder and selecting Video Graphics Array from the menu. Do this *before* you physically switch the graphics card in your computer! Or, follow the procedures outlined for OS/2 Warp or OS/2 2.x users.

4 Check Chipset Models Carefully: Make sure you're installing supported drivers for your graphics card. Many of the chipset options look similar, but are not interchangeable. For example, a graphics card based on a newer S3 chipset such as the 964 or 968 will not work with any of the S3 drivers included in OS/2 Warp. A card that uses the Cirrus Logic 5424 chipset may not work properly if you install the Cirrus 5426 or 5434 drivers.

5 Preserve OS/2 Warp's *svga.exe*: Before you install any third-party driver set, go to the OS2 directory and back up OS/2 Warp's original *svga.exe* file to another directory or filename. Some third-party driver sets will overwrite the *svga.exe* utility in the *\os2* directory with a manufacturer's version designed to match their graphics card. The third-party version of *svga.exe* is usually installed by the vendor's installation routine prior to running DSPINSTL. If you decide to switch back to a graphics card or drivers supported by OS/2 Warp's Selective Install, you'll need to copy OS/2 Warp's original *svga.exe* file back to the *\os2* directory.

Emergency VGA from OS/2 Warp 2.x

OS/2 2.x users have two ways to force the system back to a "vanilla" VGA configuration. The first is to boot to an OS/2 command prompt from the OS/2 installation floppy disks and enter the command SETVGA. This will return a series of screen prompts to insert appropriate OS/2 installation floppy disks. This procedure is not reliable with certain newer model graphics adapters, particularly those that employ an S3 chipset.

A better method to force an unreadable display to return to VGA mode is to use the *rspdspi.exe* utility. Make sure that the *rspdspi.exe* utility is present in the *\os2\install* directory on your hard disk. If *rspdspi.exe* isn't there, insert OS/2 Installation Disk 8 and unpack it with this command:

```
C:\OS2\UNPACK A:\INSTAID C: /N:RSPDSPI.EXE
```

where *A:* is the drive containing Installation Disk 8 and *C:* is the drive where OS/2 2.1 is installed. If you installed OS/2 from a CD-ROM or network then type:

```
C:\OS2\UNPACK E:\DISK_8\INSTAID C: /N:RSPDSPI.EXE
```

where *C:* is the drive where OS/2 2.1 is installed and *E:* is the CD-ROM or network. Once *rspdspi.exe* is present, type *CD C:\OS2\INSTALL* and press <Enter>.

If you installed OS/2 from floppies, type:

```
RSPDSPI /PK:VGA /SK:NONE /S:A:\ /T:C:
```

then press <Enter>. (*/T:C:* where *C:* is the drive where OS/2 2.1 is installed, */S:A:* where *A:* is the floppy disk drive you use to install OS/2.)

If you installed OS/2 from a CD-ROM or network drive, type:

```
RSPDSPI /PK:VGA /SK:NONE /S:E:\OS2SE21\ /T:C:
```

then press <Enter>. (*/T:C:* where *C:* is the drive where OS/2 2.1 is installed and */S:E:* where *E:* is the CD-ROM or network drive.)

Note: if you still have trouble after this procedure, make sure that your *\OS2* directory does not contain a file called *svgadata.pmi*. If you find this file, delete it and run through the VGA procedure again.

bulletin board in an archived format, you will have to unpack them to a floppy disk or directory on your hard disk before starting the DSPINSTL procedure. This preparation may entail using a utility like PKZIP, if the archive is a .zip file, or IBM's XDFCOPY, if the drivers are packed into an IBM disk-image file. The *xdfcopy.exe* utility should be present in your *\os2* directory, and is also located on the first OS/2 Warp installation floppy disk. To prepare a floppy disk from an image file, use the following syntax:

```
XDFCOPY [d:\]CPATH]filename.dsk a:
```

Note that OS/2 2.x users will not have the XDFCOPY utility, or the ability to unpack disk images in IBM's new, more compressed, XDF format. IBM disk images archived for OS/2 2.x can be unpacked with an alternate IBM utility called *loadskf.exe*, present in the *\diskimg* directory on CD-ROM versions. This utility can also be down-

loaded from CompuServe or the IBM bulletin board. To prepare a floppy disk for OS/2 2.x from a disk-image file, use the following syntax:

```
LOADSKF [d:\]CPATH]filename.dsk a:
```

Installing third-party drivers

SVGA, or "Super VGA," generically means any graphics monitor with either higher resolution than 640x480, or greater color depth than 16 colors. SVGA commonly means 640x480 by 256 colors.

To install an SVGA display from the vendor's floppy disks, you usually should not use the Selective Install utility in the OS/2 System Folder. Selective Install is used to change the display to one of the specifically supported configurations on the OS/2 Warp driver list. For third-party drivers, the DSPINSTL utility is used.

The exact procedure for running DSPINSTL varies from board to board.

Graphics boards directly supported by OS/2 Warp 3.0.

Generic standards:

CGA
EGA
VGA

Display Adapter 8514/a
Super VGA (SVGA)
XGA,XGA2

Third-party boards:

ATI Mach32
ATI Mach64

ATI Mach 8, ATI 28800

Cirrus Logic 5422,5424

Cirrus Logic 5426, 5428,5430, 5434

IBM VGA 256c

S3 864

S3 86C801, 86C805, 86C928

Trident Microsystems TVGA8900c

Tseng Laboratories ET4000

Tseng Laboratories ET4000/W32, /W32i, /W32p

Weitek Power 9000

Weitek Power 9100

Western Digital 90C24, 90C31, 90C33

Western Digital WD90C11, C30, C31
(in C30 mode, only)

Emergency VGA from OS/2 Warp 3.0

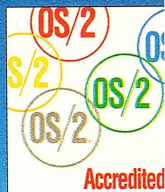
If you're an OS/2 Warp user who's made the sad discovery that <Alt+F1>, V doesn't work anymore, here's a more bullet-proof procedure that will work. Use <Alt+F1>, C or a boot floppy disk to bring up an OS/2 command prompt. Change to the *os2\install* directory and issue the following command:

```
RSPDSPI /PK:VGA /SK:NONE  
/S:[d:]\OS2\INSTALL\VGA /T:[d:]
```

where *[d:]* is your OS/2 boot drive. Note that if you have REXX support installed, you can simply create a *vga.cmd* command file that contains this statement.

Some driver-sets require that you insert a floppy disk before running DSPINSTL, and run a preparatory .cmd file to copy necessary files to the hard disk. A DSPINSTL object may be created in the OS/2 System Setup folder. Other vendors ask you to run the DSPINSTL utility.

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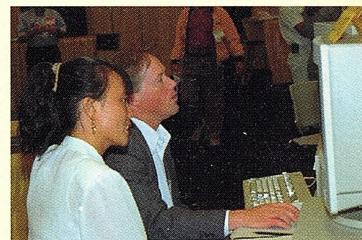
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Mini Review of Graphics Cards

In the course of compiling this feature, I tested a series of graphics cards from a number of manufacturers. The following models are all trustworthy and fast. The cards from the lesser-known California manufacturers deliver reliable performance at extremely competitive prices.

Acronics Taurus and Orion

The Orion is a 64-bit VL VESA card that comes in 1MB and 2MB configurations. The Taurus is a 64-bit card for the PCI bus available in 1MB, 2MB, and 4MB configurations. Both cards use an identical Cirrus Logic 543x driver set. The maximum screen resolution supported is 1,280x1,024 pixels with an OS/2 color depth of up to 65,536 in lower resolutions. I found that, under OS/2, the Acronix cards delivered faster performance than some of the newer, more expensive S3 models. The secret is to use OS/2 Warp's optimized Cirrus drivers rather than the floppy disks provided by the manufacturer.

Spider Graphics Tarantula

The Tarantula is a 64-bit card that comes in 2MB and 4MB configurations in both VL VESA and PCI versions. It uses the S3-Vision 964 chipset. The Tarantula supports screen resolutions of up to 1,600x1,200 on appropriate monitors (with a color depth up to 65,536 in lower resolutions). This card is fast and dependable, but the current third-party driver set has not been specifically updated for Warp OS/2 3.0. It works fine, but you may need to follow the "S3 bugfix" outlined earlier.

Spider also makes a series of less expensive 1MB and 2MB cards some that use the S3 Vision964 chip and others with Cirrus Logic chipsets.

No. 9 Graphics 9XGE64 and 9XGE64 Pro

These cards also use the 64-bit S3 Vision 864 and 964 chipsets respectively. The 9XGE64 comes in 1MB and 2MB configurations, supporting a maximum screen resolution of 1,280x1,024. The 9XGE64 Pro comes in 2MB or 4MB configurations, supporting a maximum resolution of 1,600x1,200. Both will handle up to 65,536 colors in lower resolutions.

The 9XGE64 Pro and Spider Tarantula both use VRAM and have substantially similar performance scores on benchmark tests. The 9XGE64 standard card uses DRAM and posts equivalent scores if you don't go beyond 256 colors. All of the S3 cards outperform the Cirrus Logic cards in a true DOS environment, but are slightly less efficient under OS/2. My belief is that this is an issue of OS/2 driver optimization, so these scores may be subject to change.

The No. 9 cards include a superior set of Windows utilities that none of the others offer. You have the ability to save virtual desktops, fine tune monitor adjustment and do a bitmap pixel zoom in any Windows application. It also has an OS/2 utility to reconfigure your monitor's vertical scan rate.

ty immediately from an OS/2 command prompt and set the installation directory to drive *a:*. Usually, a *readme* file on the driver floppy disk will provide details about which procedure you should follow.

How graphics installation works

When you elect to change display resolution, OS/2 conducts a series of tests to identify the chipset of your current display card, and the capacity of your monitor. During the course of a Selective Install or DSPINSTL upgrade, the OS/2 Monitor Configuration/Selection utility may pop up. If you have previously defined the vertical and horizontal scan rates for a high-resolution monitor, you can just press <Enter> to select Install Using Defaults for Monitor Type.

If you haven't matched the display defaults of your monitor and graphics card, you can select the Install Using Display Adapter Utility Program

option. This option allows you to insert an OEM's floppy disk in drive *a:*, or point to a directory on your hard drive to run a DOS monitor-configuration program. A temporary DOS session will be started, allowing you to specify pre-set or custom settings for your monitor. After you exit the configuration utility, the OS/2 driver upgrade continues.

By the way, the Monitor Configuration screen won't *always* pop up during a driver upgrade. For example, the Weitek Power 9000 and 9100 options built into OS/2 Warp for Diamond Viper graphics cards will bypass the Monitor Configuration screen and run a special OS/2 setup program.

If OS/2 complains that your high-resolution graphics card doesn't support SVGA modes, it is probably because you tried running Selective Install for a graphics card that isn't directly supported, or you selected the wrong driver set. If you see this message after running DSPINSTL, you may have neglected to

follow the instructions in the *readme* file on your card vendor's driver disks. Typically, the *readme* will tell you to run an *install.cmd* file from floppy disk and reboot the system before starting DSPINSTL.

Once the high-resolution drivers for your graphics card have been installed, there are several ways they may allow you to switch between individual display resolutions. The most common one is to have you open the System object, located in the System Setup folder. Most of OS/2 Warp's bundled driver sets add a set of display-resolution choices to the System object's Screen page—something that was much more unusual under OS/2 2.x. Some third-party driver sets use an alternate system, where a special configuration utility must be run each time you want to change the resolution. See the *readme* file on your card vendor's driver floppy disks for details.

Tricks for specific graphics systems

If you are using the ATI Mach 32 or Mach 64 drivers, you can avoid problems in Win-OS/2 sessions by adding the following parameter to the [Mach] section of *system.ini*

```
[Mach]
VAD=ON
```

OS/2 installs the Mach 8 drivers for many ATI cards, by default. An older Graphics Ultra card will work better with the Display Adapter 8514/a drivers. Use Selective Install to select the Mach 32 or Mach 64 drivers, with ATI's newer, more advanced cards.

If an installation of third-party drivers fails for a card with an S3 chipset (the system hangs when loading the Workplace Shell), it may be because the driver set was designed for OS/2 2.x, and is not aware of the new *\os2\boot* directory. What's worse, some S3 installation routines disable OS/2 Warp's automatic recovery feature so that the system won't return to the default VGA display. At the present date, the *s3-16m.dsk* image file on IBM's bulletin board has this problem.

If you've already attempted an S3 installation and failed, you may be able to solve the problem by booting to an OS/2 text command prompt. (Press <Alt+F1> when the little square appears in the corner of the screen and choose the C[ommand prompt] option.) Go to

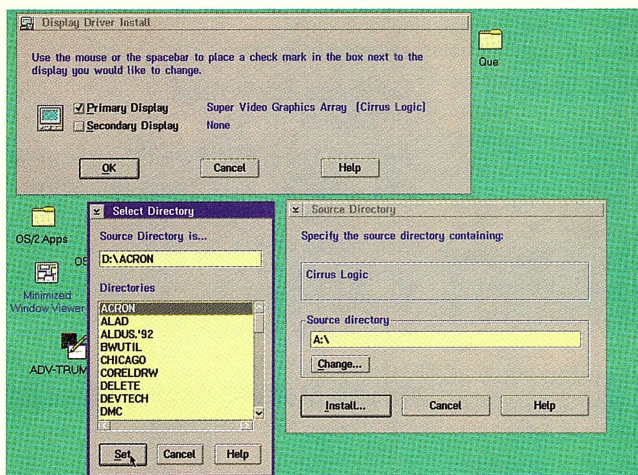


Figure 3: After the monitor configuration is completed, some upgrade routines allow you to install new drivers from a directory on your hard disk. By selecting Change in the Source Directory dialog box, you can point OS/2 to a directory such as d:\acron and click on Set to confirm the new installation directory.

the OS2 directory, and copy the following files to the os2\boot directory: svga.dll, screen01.sys, screen02.sys, pss3.dsc, ddico.exe, and dspinstl.ico. To avoid the problem with S3 drivers before it happens, copy these files from the OS2 directory to os2\boot immediately after running s3inst.cmd and before rebooting the system.

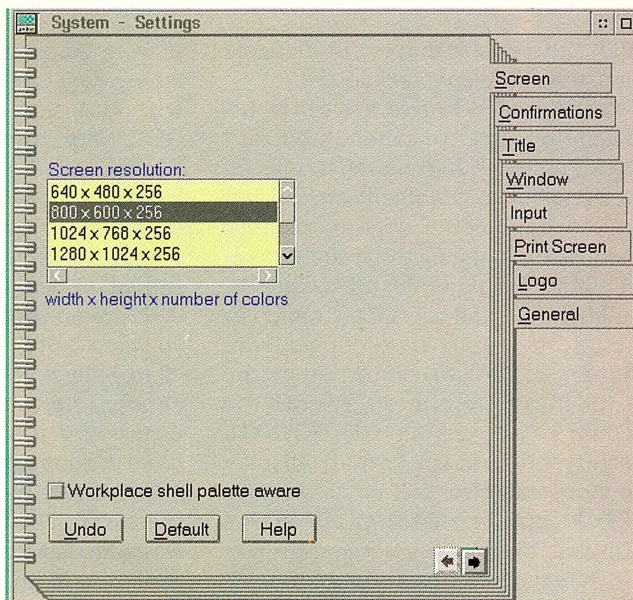


Figure 4: For most SVGA video cards, after the new drivers have been installed, the screen resolution can be changed by double-clicking the System object located in the OS/2 System Setup folder.

If you are using a card with an S3 chipset and get "mouse droppings" all over the screen or periodic system crashes, check the configuration of your serial ports. If you have a COM3 or COM4 port that uses an address between 2E0 and

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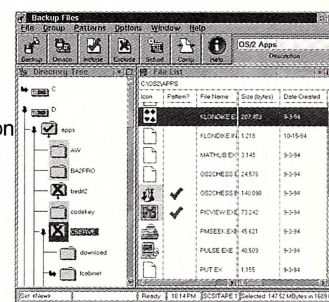
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2EF, either disable the port, or configure it to use a different port address.

If OS/2 boots to a black screen with a Diamond Viper or other 32-bit card based on the P9100 chipset, it could be the result of your motherboard's inability to handle the default memory address for mapping the Weitek graphics RAM. You'll need to press <Alt+F1> at boot time, and select the V option to restore the vanilla VGA configuration. When OS/2 Warp comes up at the 640x480x16 resolution, remove the Power 9100 drivers. (Run the DSPINSTL utility, click on the Primary Display option, and select the special Remove P9x00 option that appears in the Display Driver list.)

When you reinstall the P9100 drivers, you'll need to modify several files copied to the hard disk before shutting down and rebooting. (Details on these modifications are included in a *readme* file available with the Viper SE/Viper Pro OEM floppy disks.)

Emergency recovery procedures

If you plunged ahead and installed a dis-

play upgrade and something went wrong, you can recover your desktop without losing data in several ways. OS/2 Warp's Desktop Archive option, when toggled on, makes a complete backup of the system and desktop configuration, every time you boot the computer. If this option has been turned on, you will see a list of dated desktops on the recovery screen when you press <Alt+F1>.

In general, the best option you can choose after attempting a graphics upgrade is V. If you try to restore an outdated desktop configuration with an old SVGA display, you may or may not be successful. The Warp Archive feature was added at the last moment to the final package, and is not completely reliable. (If you want greater insurance for archiving old desktop configurations, consider one of the tools described in "Preserving your Desktop," *OS/2 Magazine*, November 1994, pp. 44-49.)

Lenny Bailes is a writer, teacher, and consultant in the San Francisco Bay Area. He can be reached via CompuServe at 70713,562.

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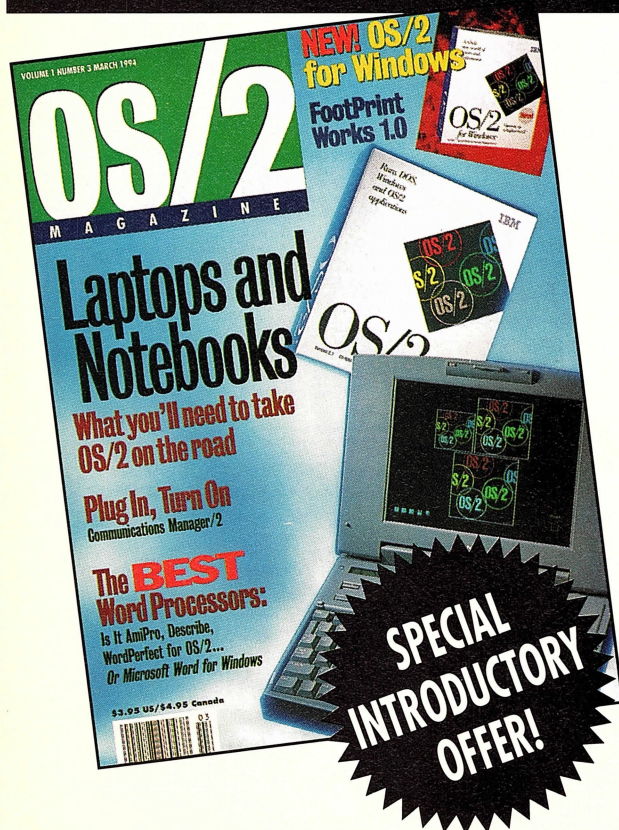
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Close Encounters with SOM

More than you ever wanted to know about the System Object Model. By Robert Orfali and Dan Harkey

If the number of print-column inches is any indicator, then System Object Model (SOM) must be the hottest technology to have emerged from IBM in the last five years. And, like all hot technologies, SOM has generated its share of "hype." SOM supporters claim it's the ultimate weapon IBM will deploy in the object wars. SOM detractors claim it's just another software abomination from IBM. Part of the SOM mystique comes from its multifaceted prowess. Is it the visual technology behind the Workplace Shell? Is it the most complete incarnation of a CORBA Object Request Broker (ORB)? Is it a better way to package object components? And, what is it doing inside the guts of OpenDoc?

Rather than write yet another boring SOM article, we'll attempt to answer these questions by sharing four personal encounters we've had with SOM over the years as authors, developers, and OS/2 users. Our first encounter with SOM was in 1992, when it first shipped as part of the OS/2 2.0 Workplace Shell. The result of this encounter was our sample Club Med program—the first Workplace Shell client/server application using SOM. Our second close encounter with SOM took place in 1993 when we explored SOMobjects—a CORBA ORB. Our third encounter occurred in 1994 when we discovered SOM in the middle of OpenDoc, where it's being used as a backplane for object communications and for packaging parts. Our fourth, and latest, encounter happened while looking under the hood of OS/2 Warp.

If you're new to SOM, we suggest that you start by reading the sidebars as a prelude to the encounters. And before we get too deep, let's get the terminology right. As of late 1994, IBM calls all the System Object Model technologies SOM. Forget names like Distributed SOM (DSOM), Persistent SOM (PSOM), Interpreted SOM (ISOM)—there is now only one SOM and it's called SOM. This new ban on four letter words, alone, should make it much easier to understand SOM. Now, let's get our time machine revved up to relive these close encounters.

First encounter: SOM and the Workplace Shell

We first ran into SOM in 1992 while writing our book *Client/Server Programming with OS/2*. At the time, we wanted to write an object-oriented user interface (OOUT) for our Club Med reservation-system program. The Club Med objects had to be totally integrated with the OS/2 Workplace Shell, meaning they had to work seamlessly with any other Workplace Shell objects. For example, to delete a customer reservation

you would simply drag it and drop it into the OS/2 shredder. The screen shot shown in Figure 1 demonstrates the look and feel of the application we ended up creating. We did it by subclassing existing Workplace Shell objects and tailoring them for Club Med.

So, what does this all have to do with SOM? For starters, everything you see on the Workplace Shell is a SOM object, which means that the Workplace Shell uses SOM wrappers to package all its visual objects (see Figure 2). To us, it meant that we could use SOM to subclass anything our hearts desired from the Workplace Shell. Subclassing lets you inherit the behavior of an object and modify (or extend) parts of it to suit your needs. After a heavy dose of bleeding-edge programming (and many sleepless nights) we were able to build Club Med by creating five new classes subclassed from SOM and the Workplace Shell (see Figure 3).

What did we learn from this first encounter? We learned that the combination of SOM and the Workplace Shell classes was absolutely extraordinary. SOM allowed us to extend any visual component of the Workplace Shell without looking at any OS/2 source code. This new magic should have opened up great new possibilities. At the time, we believed that the code in our book would help jump-start thousands of programmers into creating Workplace Shell-aware OS/2 objects. We believed that an entire industry of Workplace Shell SOM components would see the day. (We also pointed out some caveats and the roadblocks we ran into.)

What happened? Thousands of programmers bought our book and used it to learn SOM. Some, like the legendary Greg White, even wrote a killer SOM Workplace Shell application—Lotus cc:Mail for OS/2. Greg was able to effectively use SOM subclassing to mail-enable any OS/2 Workplace Shell object.

Lotus cc:Mail was (and still is) the SOM dream application. But, as everyone knows, cc:Mail for OS/2 and our Club Med were the exceptions, not the rule. OS/2 Workplace-Shell-enabled applications simply did not materialize as anticipated. Why? A postmortem reveals three reasons:

- Early SOM was single-address-based, which means that the objects we built had to run in the same address space as the Workplace Shell. An errant application could crash the Workplace Shell (not a very comforting thought). In 1993, IBM released SOMobjects, which supports multiple

address spaces even across networks. OS/2 Warp was the first release of OS/2 that took advantage of the new SOM (more on that in our fourth encounter).

- The debugging facilities and tools were very poor. Again, things are better now. Direct-to-SOM compilers, such as Metaware's, make it a joy to do the kind of SOM programming we did for our Club Med. Of course, we did not get these facilities until late 1994.
- The Workplace Shell classes were

What's the SOMobjects Toolkit?

SOMobjects is a professional programmer's toolkit that includes the following technologies:

The **SOM/IDL Compiler** provides language neutrality using OMG's Interface Definition Language (IDL). IDL is how objects tell potential clients what operations are available, and how they should be invoked. SOM provides language bindings for C and C++ that let programmers in those languages use SOM objects and create new SOM object classes. SOM provides emitter utilities that let you create bindings for additional languages.

The **Object Request Broker (ORB)** lets objects communicate across processes in a single workstation or across multiple machines on a TCP/IP or NetBIOS LAN. SOM is a CORBA-compliant ORB; it also includes a fully CORBA-compliant Interface Repository.

A **Replication Framework** lets you create copies of objects and synchronize changes made by multiple clients. Updates are automatically propagated to all the object copies. It is great for creating groupware-like applications.

A **Persistence Framework** lets you save and restore SOM objects to and from a repository that can be a file system, database, or object database.

A **Framework of Collection Classes** let you create compound objects (that is, objects that point to other objects) and navigate through the elements. SOM provides the following object container types: lists, sets, queues, and dictionaries. You can inherit from and use these SOM classes in your applications.

An **Event Management Framework** lets you organize application-level events into groups and to process all events in a single event-processing loop.

Note: The Persistence and Events frameworks APIs will change in SOM 3.0 to conform with OMG's newly released specifications for these services. This is the price you sometimes pay for being at the bleeding edge of the CORBA technology.

Adapted with permission from Client/Server Survival Guide with OS/2.

poorly documented. In hindsight, IBM never thought they would be used to do the kinds of things we did with them. But this is precisely how SOM OpenDoc components will be used to extend the OS/2 visual interface and create new forms of collaboration among visual objects.

Can you imagine where OS/2 would be today if we had thousands of Workplace Shell-enabled applications that demonstrated the power of OOUI? It took OS/2 Warp and better tools to get the stars to line up. The good news for OS/2 is that, even in early 1995, no other OS offers anything as revolutionary as the SOM-enabled Workplace Shell classes. So, it may not be too late.

Second encounter: SOM as a CORBA ORB

Our second close encounter with SOM was in 1993, when IBM shipped the SOMobjects toolkit. Part of that toolkit

contains a distributed version of SOM (the one that was used in OS/2 Warp). The new SOM provides an object backplane bus that's compliant with the Object Management Group's Common Object Request Broker Architecture (CORBA). The CORBA standard is now supported by over 400 vendors, which means that the backplane will, eventually, let objects talk to each other across multivendor networks and OSs.

We worked closely with SOMobjects as client/server tool developers (and book authors). The most tangible result of that work was our next book *Client/Server Survival Guide with OS/2*. In that book, we make a strong case for distributed objects. We believe they offer the best hope for creating, managing, and deploying client/server applications. We used SOMobjects to get hands-on experience with this new technology. We must have liked what we saw because we now work for the objects group in Austin. In a nutshell,

Where to Get More Information

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by Robert Orfali and Dan Harkey
Van Nostrand Reinhold, 1994
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This book contains a general introduction of OpenDoc, OLE, SOM, CORBA, and Taligent.

Client/Server Programming with OS/2

by Robert Orfali and Dan Harkey
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Objects for OS/2

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Object-Oriented Programming Using SOM and DSOM

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This book covers SOM and SOMobjects—it's also an excellent new book for programmers.

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This book explains the benefits of object-oriented user interfaces such as the Workplace Shell.

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This program is available by ordering the OS/2 Developer Connection CD-ROM, (800) 633-8266
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we discovered that client/server with objects offers the following advantages:

- Objects allow intelligence and data

to be packaged and distributed at the level of granularity that makes the most sense. SOM and other CORBA object request brokers (ORBs) pro-

vide the technology to package objects as components that can communicate using standard protocols across networks and OSs.

- Objects and SOM technology can be used to encapsulate existing applications. They can participate on the object bus without having to rewrite existing code. The magic that makes this possible is the CORBA Interface Definition Language (IDL). The IDL lets you specify component interfaces independently of how they are implemented.
- Objects are self-managing. Objects can maintain their own management data, deal with local problems, and respond to commands from a remote management station. They can act much more responsibly than anything we ever put on a network—they're very intelligent entities.

This is all very nice, in theory, but we need mission-critical commercial products that can realize the potential of distributed objects. SOMobjects in 1993, was the first commercial CORBA-compliant ORB to ever ship. So, you can

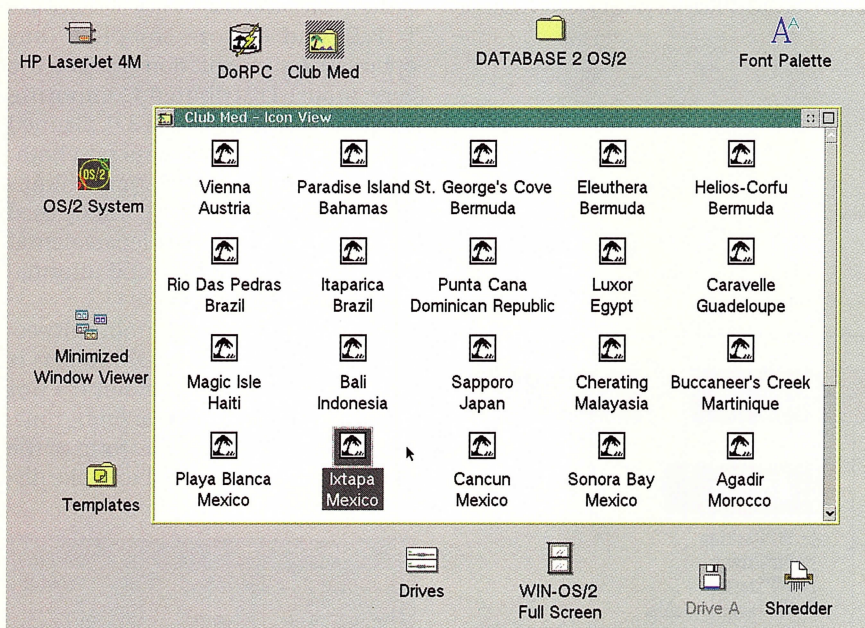


Figure 1. The Club Med Workplace Shell Application.

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understand why that second close encounter was so important to us. SOMobjects currently allows objects in OS/2 to interoperate with objects on AIX, DOS/Windows, and OS/400. Apple is porting SOM to the Macintosh plat-

form as part of OpenDoc. And SOM will be supported on many other platforms.

SOMobjects makes it possible to create client/server object applications on top of socket-based TCP/IP, IPX/SPX, and NetBIOS stacks. A future version of

SOM will support the latest OMG CORBA 2.0 specifications for interoperability across multivendor ORBs. In December 1994, OMG voted to support a least-common-denominator intervendor ORB-to-ORB protocol based on TCP/IP and a more complete (but optional) implementation based on the very robust Distributed Computing Environment (DCE). SOM 3.0, planned for mid-1995, intends to support both. ORBs, like SOM, will become ubiquitous in the mid-90s. They will be used for Internet commerce, departmental client/server computing, and information systems of all types.

So what did we learn from this second close encounter? SOMobjects is exciting new technology but it's not quite ready for client/server prime time. It represents an embryonic form of the plumbing that's required to make dis-

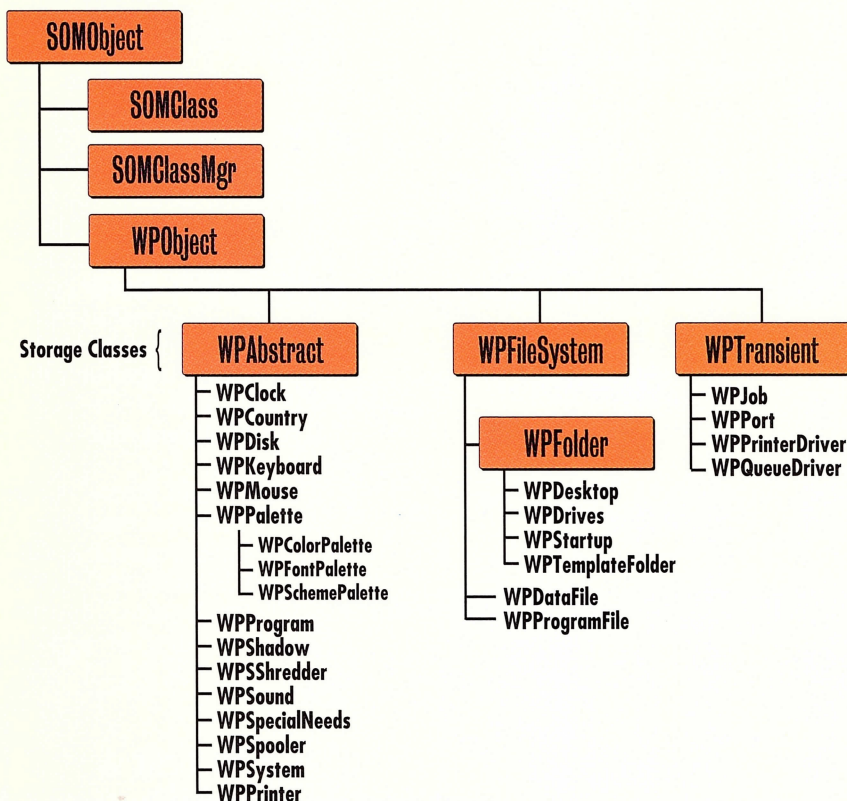


Figure 2. The Workplace Shell Classes.

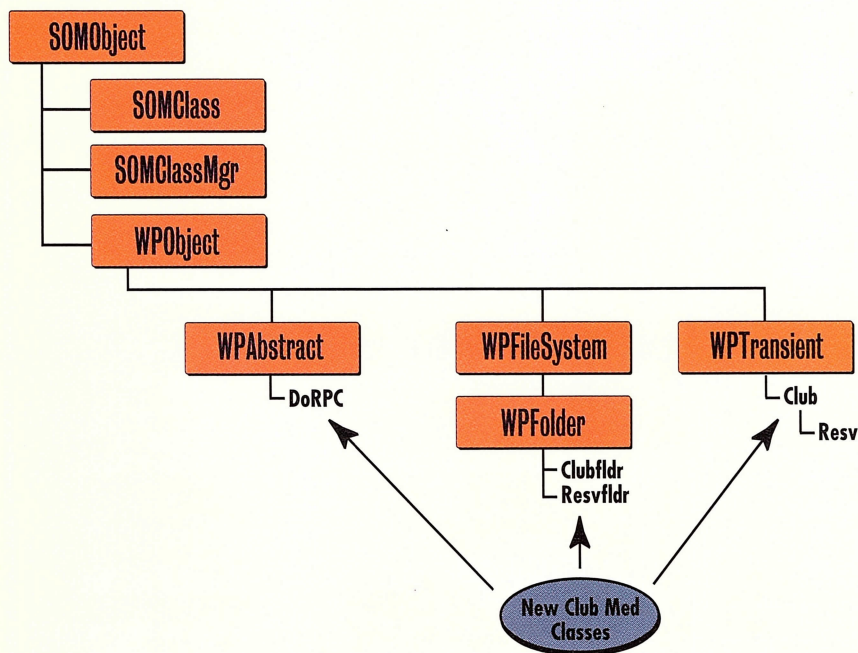


Figure 3. The Club Med Subclasses.

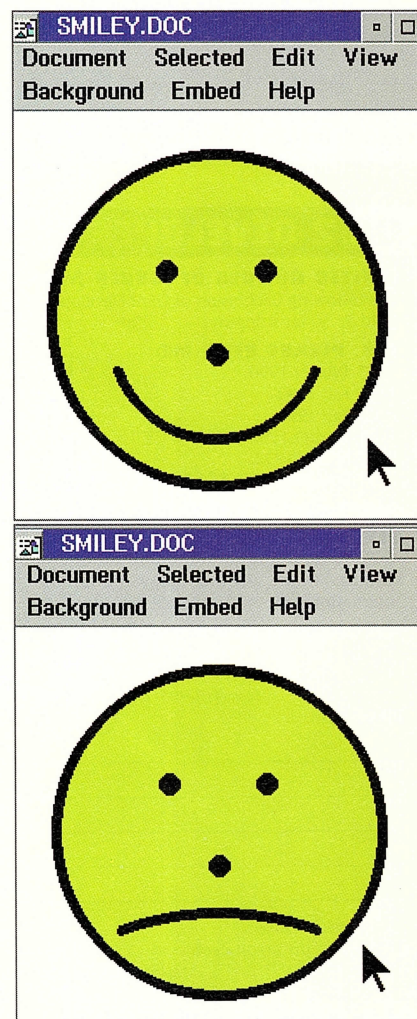


Figure 4. The Smiley OpenDoc Part With Smiling and Sad Faces (Reprinted with permission from Dr. Dobbs Journal, March 1995).

tributed objects work. We say "embryonic" because there is a lot more that needs to come together before distributed objects can take off in a big way. We should be getting that next increment of technology in SOM 3.0—due in mid-1995. SOM 3.0 will, eventually, be

bundled with OS/2 and other OSs. It will include OMG's new services, such as naming, lifecycle, persistence, events, and transactions. This level of plumbing (together with DCE) will allow objects to play at the intergalactic level. It's well worth the wait.

Third encounter: SOM and OpenDoc

Our third close encounter with SOM was in 1994, when we discovered it in the middle of OpenDoc. To get a feel for the technology, we wrote the first SOM OpenDoc part—a Smiley face that

SOM as a Component-packaging technology

SOM provides the industry's first implementation of a CORBA-compliant, language-neutral environment for defining, manipulating, and releasing object components and class libraries. SOM objects are language-neutral in the sense that they can be implemented in one programming language and used by applications or objects written in another programming language.

SOM makes it possible for components and classes to be shared and ported across languages. It does not compete with C++, Smalltalk, C, or any programming language; it complements them. A programmer can develop, subclass, or use a SOM object in any supported language without learning a new syntax or conceptual model. SOM provides a solution to this very real and pressing problem: How do you package class libraries and components that have properties similar to our current Dynamic Link Libraries (DLLs)? In other words, how do you package components as binary executables without giving away the source code?

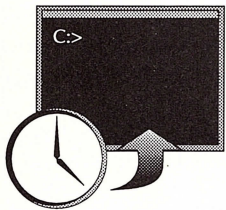
SOM allows a developer to define classes and methods using C, C++, and Smalltalk (and soon Cobol and REXX). Programmers should be able to use SOM quickly to develop object-oriented programs without having to learn a new language syntax. SOM, however, is specifically designed to work with both procedural (non-object-oriented) languages and object-oriented languages such as C++. Why do I need SOM when I have C++? Now that

it is available, 32-bit C++ is becoming the language of choice for programmers wanting to build system class libraries. However, C++ without the SOM run time is not usable for building binary class libraries because:

- The binaries of one C++ compiler are not acceptable to another.
- An application that binds to a C++ DLL will need to be recompiled if the DLL is replaced with a new release, unless the developers make almost no changes to their implementation.
- The use of the libraries from any other language (even C) would be almost impossible.

SOM solves these problems by making object technology binary (just like DLLs for procedural languages). It's the first commercial technology that makes it possible to package objects as sharable "dynamic binary modules." SOM does that by packaging "neutral" object classes in standard binary library formats—DLLs for Windows and OS/2 and shared libraries for UNIX. This approach makes it possible to ship objects as ordinary DLLs—a technique that's very popular with other forms of shrinkwrapped commercial software. Table 1 compares the packaging features of procedural libraries (DLLs), traditional class libraries, and SOM class libraries. *Adapted with permission from Client/Server Survival Guide with OS/2.*

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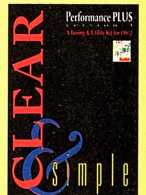
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Table 1: Comparing Packaging Features for Code Libraries.

Packaging Feature	Procedural DLLS	Ordinary Class Libraries	SOM Class Libraries
Language neutral classes	Yes	No	Yes
Can ship classes as binaries	Yes	No (frequently requires shipping the source code)	Yes
Sharable classes	Yes	Almost never	Yes
Supports inheritance	No	Yes	Yes
Clients must be recompiled when implementation changes	No	Yes	No

This table makes it clear why we haven't achieved object-code reuse. SOM fixes this problem. SOM classes can be distributed as DLLs or UNIX shared libraries. SOM also provides hooks for exchanging class libraries with other object-oriented languages. SOM's language neutrality makes it possible for a Smalltalk object written in SOM to communicate with a C or C++ SOM object. This technology is absolutely essential for the deployment of components—such as OpenDoc parts—written by vendors that know nothing of each other.

SOM class libraries (present and future) are designed to be part of the operating system. The promise of SOM is to make object-oriented technology part of the operating system, not part of a programming language. SOM allows the integration between operating-system objects and user-supplied objects to be as efficient as possible without requiring users to recompile their programs when the next version of the operating system appears.

appeared in the March issue of *Dr. Dobbs' Journal* (see Figure 4). In the November 1994 issue of *OS/2 Magazine*, we described how OpenDoc extends the Workplace Shell's object-oriented user interface paradigm. We anticipate that OpenDoc will be used to create what IBM calls "pluggable places" of cooperating visual components. These pluggable places will be built using suites of collaborating OpenDoc parts. For example, home users can work with pluggable places such as a home entertainment center, kitchen, or study. Legal firms and dentists will have their own pluggable places. It's good-bye monolithic desktop and welcome to the age of collaborating visual places.

So what did we learn from this third encounter? SOM provides essential plumbing for packaging OpenDoc components, allowing them to describe their interfaces to clients, and to communicate with other components. A SOM component, unlike its OLE counterpart, can be subclassed. Vendors can create new components by simply inheriting functions from existing components and extending them. SOM allows desktop components to communicate with intergalactic components anywhere on the CORBA ORB. With SOM and OpenDoc, components can communicate via drag-and-drop, cut-and-paste, linking, events, scripting, or via inter-ORB

client/server invocations. SOM makes it easier for these independently developed components to discover each other at run time. It also makes it easier for developers to create autonomous components that can be packaged to play in collaborative suites or as stand-alone entities. Welcome to the software component revolution.

Fourth encounter: SOM and OS/2 Warp

Our fourth, and final, close encounter with SOM was in late 1994. We went back to our old haunts and revisited the Workplace Shell in its new OS/2 Warp incarnation. We were particularly interested in how OS/2 Warp took advantage of SOM's distributed capabilities to solve the problems described in the first encounter. The result of this encounter was a program that used SOM's distributed facilities to invoke across processes (or networks) any method on any Workplace Shell object. A remote program can have full control of the Workplace Shell, which can act as a visual server. We demonstrated the program at a technical session we gave at the Colorado OS/2 technical conference.

So, what did we learn from this fourth encounter? OS/2 Warp fixes some of the problems we referred to in the first encounter. You can now write programs that invoke Workplace Shell Objects across process boundaries—it's

a nice firewall. OS/2 Warp provides some new APIs that make it easy to navigate through the SOM Workplace Shell objects from a remote program. And the tools, this time around, are much better. However, you still can't subclass Workplace Shell objects across address spaces. The bottom line is that OS/2 Warp makes it much easier to work with Workplace Shell classes, so you may want to revisit this opportunity to create SOM Workplace Shell objects.

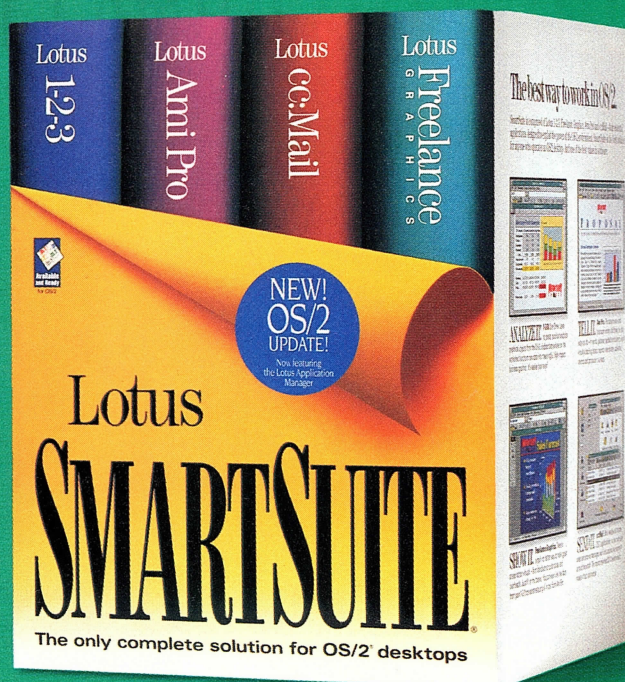
Conclusion

As you can see, SOM is truly multifaceted. And, as you can tell from our four encounters, a lot remains to be explored. We anticipate that there will be quite a few more close encounters in the future. SOM, obviously, provides value to programmers and component providers: It gives us a technology for packaging and selling our components. SOM is equally valuable to system integrators and IS shops: It provides the technology for the components to work together on desktops and across the enterprise. Finally, SOM is a very important part of OS/2 because it provides the plumbing for the Workplace Shell and OpenDoc.

One of the questions we were asked to answer for readers is: What does SOM do for the OS/2 power user? You will definitely benefit from SOM components, OpenDoc, and the Workplace Shell. OpenDoc parts can be a power user's version of heaven. However, there is very little you can do to tinker with SOM directly. The one possible exception is a future product that goes by the name Object REXX. This product may directly surface some of the SOM APIs to scripters. Warning: SOM is addictive—you may well end up writing about your own close encounters and become one of us.

Bob Orfali and Dan Harkey are the authors of Client/Server Programming with OS/2, Essential Client/Server Survival Guide, and Client/Server Survival Guide with OS/2, all published by Van Nostrand Reinhold. Bob and Dan have been developing client/server applications and tools for the last eight years. They currently work on the application of distributed object technology. Bob and Dan are affiliated with IBM's Personal Software Products division, and work from the San Francisco Bay Area.

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InterActivity

The How-To Multimedia Magazine

A new OS/2 spreadsheet

Mesa 2 from Athena Design. BY KATHY IVENS

For all the bean counters who constantly pursue new and innovative ways to add, multiply, average, and otherwise manipulate numbers, Mesa 2 from Athena Design Inc. provides a 32-bit, native OS/2 spreadsheet application. The software takes full advantage of the multitasking environment and the Workplace Shell and offers plenty of bells and whistles. However, some of the rudimentary functions and keystrokes that bean counters traditionally expect from spreadsheet software are absent, and although these missing items are easy to fix (and probably will be fixed), they detract from the overall usability of an otherwise excellent software package.

Installation

Installation is uncomplicated, graphical, and animated with an amusing replication of a floppy disk drive accepting a diskette during the Insert Diskette #2 message. The software uses the IBM Install program familiar to OS/2 users, and offers choices about the number and type of files to be installed, ranging from program files only to example files, source code for examples, and on-line documentation. The on-line help files are a must, however, since the software arrives with practically no

Number crunchers, even the ones who don't spend every moment of the workday in spreadsheet software, use the keyboard. Reaching for a mouse is neither intuitive nor productive.

hard copy documentation. If you want the convenience of having help and instructions next to your keyboard, or in a form that permits you to read

instructions when you're away from your desk, you'll have to purchase it for an additional cost, which I hope isn't a new trend in the commercial software world.

Getting starting

When you launch Mesa 2, a workbook file (the software's terminology for a spreadsheet file) called *autoload.m2* displays. This document provides plenty of sample features that you can examine to learn about the feature set available in the software. You can use configuration options to stop this workbook from loading, substituting either another workbook or a blank workbook.

Using the program is pretty much the same as using other spreadsheet applications. Data being entered is displayed on a formula bar at the top of the window and is moved to the selected cell when the <Enter> key is pressed. Selecting a cell that has data produces a display of that data on the formula bar. Entering data in a cell that contains information replaces the information. Editing existing data is a simple matter of selecting a portion of that data in the formula bar by dragging the mouse and then entering the replacement data. Some editing shortcuts are provided; for example,

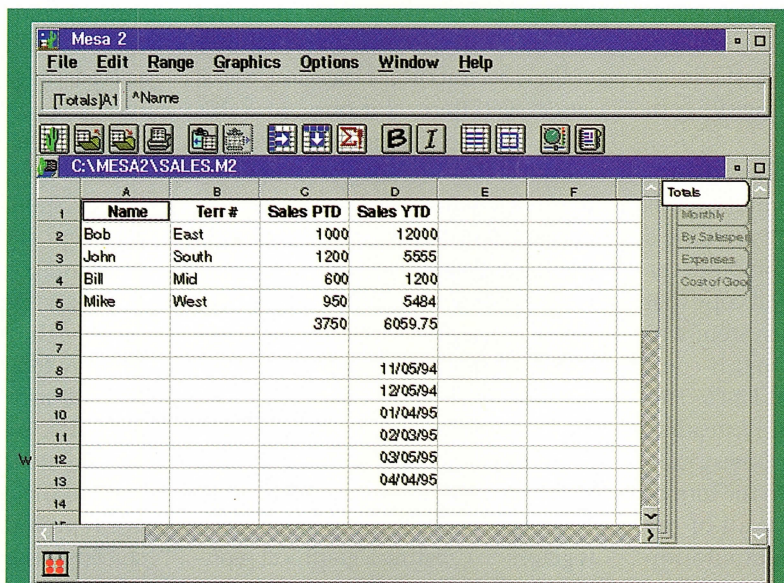


Figure 1: Notebook tabs make moving from layer to layer a one-click operation in Mesa 2 from Athena Design.

Review

you can replace a word by double clicking it. You can insert additional data by placing the insertion point at any character or space, and you can delete individual characters with the <Backspace> or <Delete> keys.

As with all spreadsheet software, the formula bar displays formulas while the cells display the value. Additionally, cells can accept formatting information, including typeface, font, size, color (both background and text), and alignment.

For OS/2 users, it is the interface that provides some of the attraction for this application. The software follows the OS/2 Notebook convention throughout all of its displays, functions, and features, making it easy and comfortable to maneuver through application settings and individual workbooks. The OS/2 Clipboard is available, and there's a generally cozy, familiar feeling about the interface.

Additionally, plenty of one-click maneuvers are provided, so that direct manipulation is part of the streamlined interface. Moving, copying and auto-filling ranges of cells is extremely easy, requiring only the familiar select-drag-drop techniques used on objects on the WPS. Dragging moves the range and dragging while holding the control key copies it.

You can copy formulas with or without the "make this formula fit this cell" technique. That is, if you have a formula in Cell D6 that computes the average for Cells D2-D5 and copy that formula to Cell F6, the system will change the formula so that it computes the average for Cells F2-F5. This is an intelligent and intuitive feature. However, if you want, for some reason, to keep the original cells in the formula, you can make part or all of the range used in the computation absolute.

There's a "smart fill" that lets you fill cells sequentially, but it's not as smart as the same feature in most

other spreadsheet applications. The missing ingredient is a pop-up choice, making it necessary to enter keystrokes to begin the sequence. And, as a result, some sequences aren't automatic at all. For example, you can enter Monday in a cell, then smart fill the next six cells by selecting them and choosing the function. You can enter January and see the rest of the months fill in the length of the selected cell range. If you enter the date January 10, the system will fill cells with February 10, March 10, and so on. But months don't all have the same number of days, and a bit of editing is necessary to create columns for the last day of each month—a rather normal column for anyone performing accounting functions. All of the other spreadsheet applications I've ever used had predetermined, common pop-up choices so I didn't even have to enter data into the first cell to begin the process. I just told the software to create a column or row for the end of each month or the end of each week. I found the keystrokes involved in using Mesa 2 for this function more onerous and more annoying.

The ability to select and name a range is an important function, and it works well here. Not only does this mean an easy reference when creating formulas that include that range, but the ability to have pointers to a range contained in other parts of the workbook is a breeze. In addition, some word processors will link to a spreadsheet range and will accept a range name, which is much easier to remember than the actual cell addresses involved in the range. It's easier to remember *Net_Profit* than a long involved formula.

One of Mesa 2's strongest functions is graphics. Creating a graphical representation of the numbers in the workbook or any range therein is a simple matter of selecting a range and using the Graphics menu option. There are

plenty of graph types to choose from and robust configuration choices for customizing your selection.

If the first column or the top row of the selected range contains titles, they will automatically appear as labels. Graphics also have drag-and-drop capabilities. You can create graphic shapes that don't represent any values, but are used to highlight or draw attention to a portion of the workbook. These shapes can be anchored to specific cells so that, no matter what additional cells are used, the graphic stays a certain vertical and horizontal distance from the cell you've linked it to. Or, it can be right on top of the cell it's linked to.

Bitmapped graphics can be imported via an Import Graphic menu item, or merely dragged from the desktop.

One of the real fortes of this application is the ability to build layers in a workbook, a process that is accomplished with ease. Layers are pages and I was able to build individual layers containing text, formulas and graphics, for each salesperson I invented, with monthly totals showing. I also built the indexed version of that information, with a layer for each month, sorted by salesperson. (There's an indexing page on the Selections notebook available through the Options menu item.) I had layers showing the various subtotals of those two formats and kept the imaginary company's sales totals on the top layer. Then, I built expense layers, by cost type and by month, and moved those totals into my top layer. Creating a formula that subtracted expenses from revenue gave me a look at the net profits. It was easy to move from this "at a glance" view to the details because the layers are represented to the right of the spreadsheet grid by notebook tabs, and a click of the mouse moved me to the layer I needed. You can configure each layer for size (rows and columns) and attributes, a handy feature. As you

Review

move through the layers, not only do you see the appropriate tab highlighted, but the layer's title is displayed to the left of the formula bar. This feature makes it easy to navigate through a complicated workbook.

Automated procedures

The real power (and most fun) is in using Mesa scripts. These are automated procedures, called "macros" in other spreadsheet packages. However, Mesa 2 uses REXX for its scripts and brings the power of REXX to its automation functions.

Every REXX script is saved as a separate page in the workbook, with its own tab, so it's easy to find if you want to edit it. You can execute the script by holding the <Shift> key while pressing the page's tab. There are even some Mesa 2-specific functions available for your REXX scripts.

REXX scripts can run repetitive tasks within a workbook, or have scripts that run when a workbook is opened or closed. This ability lets you, for example, auto-configure the software's environment for specific workbooks, and then reset it upon exit of that workbook. Also, because REXX runs everywhere in the OS/2 environment, you can even have your Mesa 2 REXX scripts communicate with other applications or with the WPS.

Functions

The important features, if we compare Mesa 2 to the popular Lotus 1-2-3, are all there—a toolbar for oft-used functions below the menu bar (although you can't create your own toolbar icon the way you can in Lotus), autofill, a formula entry with built-in formula types such as dates, named ranges, database functions that include sorting and selecting, financial functions such as declining balances and rates of return, arithmetic functions such as quotient remainders and roots, and statistical functions such as averages.

There are a number of other nice touches I should mention, such as the ability to have an unlimited number of windows open, either one window for each workbook, multiple views of different sections of a large workbook, or a combination of both. If you have a workbook open and have a view of a section of that workbook displayed, any changes made are updated immediately. The import functions are robust, and you can either use the Import functions on the File menu or the OS/2 Clipboard. Text files import with the assumption that line feeds and carriage returns indicate a new row, while tabs are the breaks between columns.

For spreadsheet files, Mesa 2 recognized Excel and 1-2-3 files and displayed them when I used File, Open, and I didn't need to use any import menu function. It also includes a real-time data-feed program, so you can go outside the software, find data, and have it update a workbook. An example is included in the on-line documentation that describes what happens when the function finds stock prices, brings the data into a worksheet and then follows prepared guidelines about actions to be taken on the data. For instance, you can build a formula that says if a price drops below a certain level, you want to be signaled that you wanted to buy this stock when it got this low. I didn't use this function, so I can't discuss it intelligently, but the concept is probably interesting to some people and it probably has a more universal use than the example cited in the software's on-line documentation.

Caveats

Sadly, the fact that Mesa 2 takes advantage of the OS/2 environment is offset by its general approach to users. It's not friendly. That is, it doesn't work the way people who use spreadsheets work. For example, you can't move

around without the mouse. The <PageDown> and <PageUp> keys aren't used, so you have to use the scroll bar. When you are building a formula in a cell, you can't use a cursor key to indicate that the cell next door is being referenced—instead, you have to reach for the mouse.

Number crunchers, even the ones who don't spend every moment of the workday in spreadsheet software, use the keyboard. That's where the numbers are, and they're right next to the cursor keys and the <PageDown>, <PageUp>, <Home>, and <End> keys. Reaching for a mouse is neither intuitive nor productive. This isn't a graphics program where a mouse and all the graphical bells and whistles are appreciated. It isn't a word processor where the need to move back or left or right or up or down isn't the norm. Word processors are mostly used for typing. You only need to move to another part of the document when you are editing. Little cross referencing between one part of a document and another is necessary. But a spreadsheet is a cross-referenced document by nature. You move left, right, up, and down to reference cells, look at ranges, and so on. Taking your fingers off the calculator keypad, reaching for the mouse, and moving back is not going to make the average spreadsheet user very happy. (I should mention that the <Home> key *does* work; it moves you to cell A1.)

I gave an experienced spreadsheet user, who is a controller by profession, a chance to play with the software on my machine. He got up after a half hour and announced it wasn't worth the effort. He, like most users, didn't care how OS/2-compliant the software was. He didn't care about 32-bit performance. He didn't care about anything except getting data into his spreadsheet. He hated having to reach for the mouse for minor movements between cells and to scroll down 20 rows (he uses Windows spreadsheets

Review

so it's not that he doesn't understand the mouse). He also hated the fact that he had to do so much data entry to use the Smart Fill function because standard autofill norms aren't provided.

He is no different than any other bean counter I've ever met. Few of them will be happy with Mesa 2's user interface. And, the fact is, they're right. The interface with the operating system and the advantageous use of an operating system's features should be taken for granted and transparent—not part of the feature set. The feature set should be application-specific. The bells and whistles are terrific and helpful, but spreadsheet software is for number crunching—getting the numbers in, the formulas in, the formulas connected and linked, and so on. This software has its priorities wrong in that respect.

Sadly, the software also has some serious video problems. When first tested, the program corrupted my

WPS video so badly that a reboot was necessary whenever Mesa 2 was closed. A discussion with the company produced a new set of disks representing an update and, although the problem lessened, it is still there. Several programs ran with corrupted video after using Mesa 2 without a reboot. I have a "plain-vanilla" VGA controller in my OS/2 machine and have never encountered any other video problems in OS/2 or Windows. I'm assuming the company will straighten out this problem, it can't be endemic or a typical OS/2 problem since other software developers don't seem to suffer from it.

I tested this software on a no-name clone 386 machine running OS/2 Warp for Windows on a 320MB IDE drive. The speed of the software was excellent when loading workbooks, cascading or tiling windows, creating or importing graphics. The only slow function was scrolling through a work-

book. The ability to have the power of REXX, the configuration notebook and the easy graphics probably means I'll use this software occasionally. If they would change the user interface and let me fly without a mouse during data entry, I'd use it exclusively. (Editor's note: As we went to press, Athena Design announced the release of an updated version of Mesa 2. For more information see *Just Announced*, p.51.)

Kathy Ivens is a computer consultant and writer in Philadelphia PA. She has written a number of books, including several on OS/2, and is a frequent contributor to several national publications.

RESOURCE

Mesa 2

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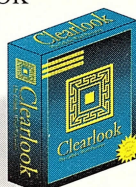
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Getting the most out of your modem and OS/2 with EmTec's Zap O'Com 2.02 **BY STEVEN J. VAUGHAN-NICHOLS.**

To be successful in the communications business, a telecommunications program must have certain essential ingredients. The first of these is support for a wide variety of terminal types. Here, Zap O'Com 2.02 (ZOC) does well, with its support for the most popular types: TTY, VT-102, and ANSI. Unfortunately, ZOC doesn't support the VT-102's 132-column mode. ZOC stands out from its competitors by enabling you to have more control over the terminal types' settings. Still, it would have been good to see support for other popular business terminals, such as the VT-220 and IBM-3101.

Another "must have" is support for a wide variety of upload and download protocols. For many of us, on-line file hunting is the most fun we have with our modems—if getting the file goes quickly. Here, ZOC doesn't sit behind any other program. It includes internal support for the ever-popular end-of-the-alphabet protocols: X-Modem, Y-Modem, and Z-Modem. The program also supports CompuServe-B+ and Kermit as supplied external protocols. The last two can be life savers. CompuServe-B is the fastest protocol you can use on CompuServe and Kermit is often the only protocol offered on some minicomputers. If you want another external protocol, ZOC makes it easy to support such protocols as C2KERMIT.

ZOC's protocol implementation is first-rate. For example, when you download multiple files with Z-Modem you get two progress bars. One shows you how close

you're getting to completing the download of the current file and the other shows you how you're doing with collecting all the files. After all, when you're downloading files, every second counts and costs.

ZOC's programmer, Markus Schmidt, is also well aware that time is money. ZOC has a unique feature that makes it possible to automatically track how much money you're paying for a visit to a BBS or on-line service. You have to fill in the data, of course, since prices vary so wildly depending upon time, distance and the on-line service in question. Once you've taken care of that, however, you'll always have an accurate dollars-and-cents odometer clicking away on the display's status line. This way, you'll never be surprised by unexpected charges on your credit card.

If it's just ASCII text you need to grab, or you need to go back to information that scrolled by dozens of kilobytes ago, ZOC will serve you well. The program starts with a default scrollbar

buffer of 128K but you can make it as large as you like. Marking, moving, and copying text has never been easier.

The program also excels at giving you control over all of its features. You get absolute authority on everything from delay times between redial attempts to locking your macro keys from snoopy co-workers.

The people who will have the most fun customizing ZOC will be REXX programmers. ZOC is designed to work hand-in-hand with REXX. You can customize ZOC behavior or automate complex series of on-line commands. Better still, REXX programs get their own thread so that, by taking advantage of OS/2's multithreading capabilities, ZOC runs faster while performing automated tasks than other OS/2 communication programs.

If you think the only thing that REXX is a good for is a name for a dog, it's still possible for you to automate some on-line jobs. ZOC makes automation easy with automatic scripting functionality. If you want to learn

REXX, you can also record crude REXX command sequences from your on-line sessions. These will need some polishing, but that's how you'll pick up REXX.

In some areas of customization, however, you might wish that Schmidt would do your work for you. Unlike most communication programs, ZOC offers no automatic setup parameters for a wide variety of modems. Instead, you must hope that the simple default modem strings will work with your modem. Or, as was the case with my Intel 144E modem,

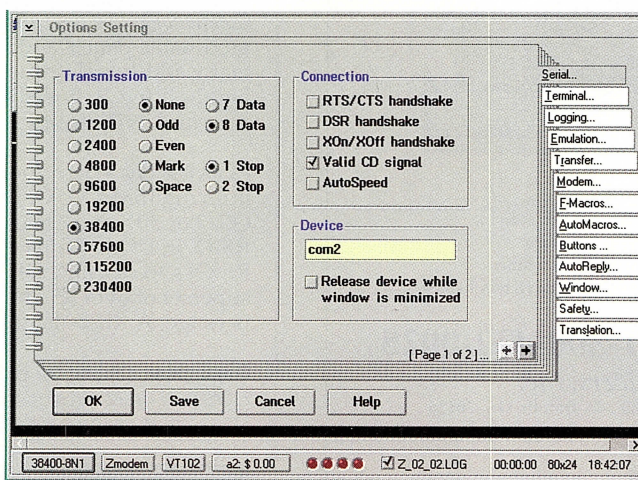


Figure 1: You say you like control over your communications programs? Then, you'll love ZOC.

Review

you'll need to manually enter the complete modem setup strings to get the modem to work properly. That's no big deal if you're an old hand at modems. If you're a newcomer, be ready for some trouble as you fight with such unforgiving strings as:

AT&D2&C1V1X4Q0E1S7=60M1

to get your modem up to snuff.

Another ZOC shortcoming, which it shares with all other OS/2 programs, is its lack of support for TeleGrafix's Remote Imaging Protocol (RIP). RIP graphics form the heart of today's BBS graphical interfaces.

ZOC does offer graphics support, however, that other programs lack. At this time, ZOC supports CompuServe's GIF. ZOC is also the only asynchronous communications program that automatically supports JPEG image viewing.

Taken as a whole, ZOC moves very

smoothly. It's a rare program that gives you great and precise control over its functions, while still being easy to use, but ZOC manages it. It makes full use of OS/2 notepads for its options and the plentiful help information is stored away in proper OS/2 on-line booklets. If you've never used a communications program before, you'll like this one. If you are an experienced on-line veteran, don't be surprised if ZOC charms you with its interface.

Want to get a copy? It's easy to do. ZOC is a shareware program that's available from a variety of sources. You can find a copy of it on CompuServe at the OS/2 shareware forum (GO CIS:OS2SHARE) or on the Internet at several OS/2 ftp sites such as: <ftp://ftp.demon.co.uk/pub/os2/comms/zoc>; <ftp://ftp-os2.cdrom.com/pub/os2/incoming>, and hobbes.mnsu.edu/pub/os2/com. The program costs 93 Deutsche Marks. When this article was written, that came to

about \$61 U.S. For support, you go directly to the designer himself. He monitors the CIS shareware forum, the *comp.os.os2.apps* newsgroup on the Internet and the BBS FIDO network's OS/2 forums. You can also write or call him directly. Mr. Schmidt is always clear and precise with his answers.

When all is said and done, there can be little question that ZOC is the best OS/2 communications program on the market today. Unfortunately, it still lacks support for several popular terminals and the RIP Graphic standard. Hopefully, later versions of this program will correct these shortcomings. If that happens, OS/2 will finally have a program that excels its Windows counterparts in every way.

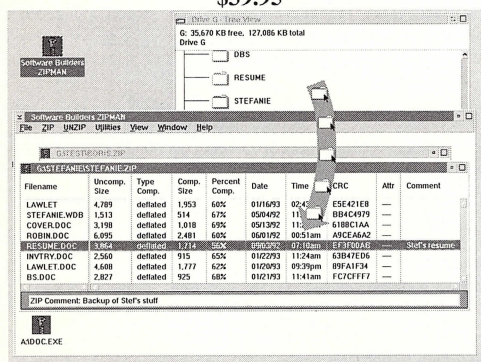
Steven J. Vaughan-Nichols is a freelance writer working out of Lanham, MD. He can be reached as sjvn@access.digex.net or CompuServe 72241,464.

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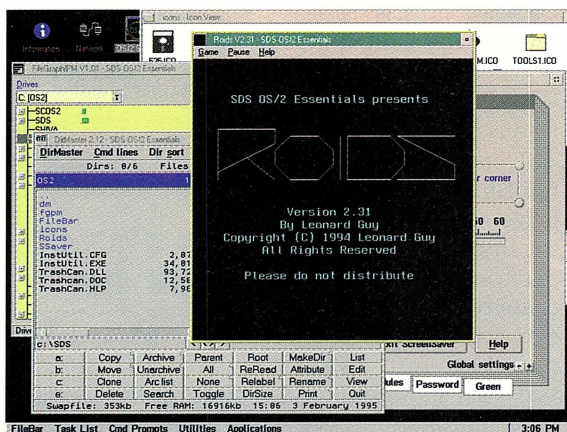
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Boot OS/2 without installing it in your hard drive

OS/2 MAGAZINE APRIL 1995 51

Just Announced

ports various cards for mixed environments. The price of these programs BootWare is priced at \$49 and BootWarePLUS is priced at \$79. For more information call LANWorks at (905) 238-5528, fax (905) 238-9407.

READER SERVICE NO. 162

ZipStream 1.03

Compressed-drive driver

Carbon Based Software is announcing a new OS/2 disk-compression program called ZipStream. This program creates an installable file system that creates a new logical drive and all files on that drive are compressed automatically. ZipStream is available for a suggested retail price of \$79.95. For more information, call Carbon Based Software at +61 75 37 1949, fax +61 75 29 1544.

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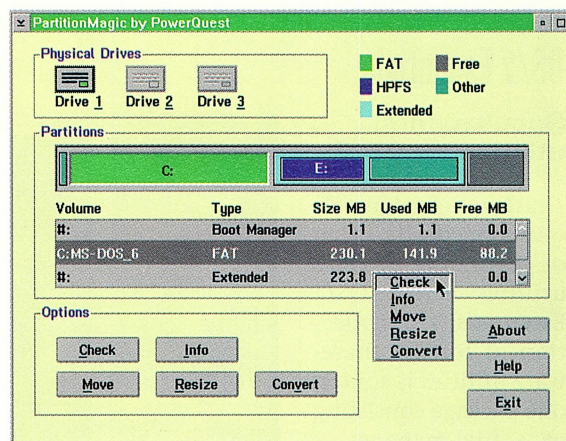
Partition Magic 1.0

Turn your excess FAT into HPFS

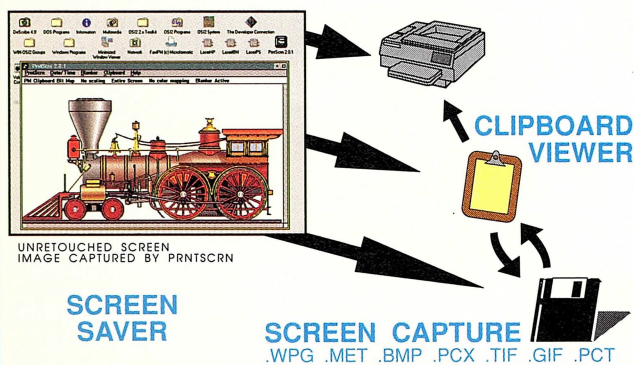
PowerQuest is releasing a new hard disk partition-management utility called PartionMagic. With this product, partitions can be dynamically resized without reformatting the hard drive or losing any of the information in the partition being changed. This program can also change FAT partitions into HPFS

and has a "Power-Failure-Safe" feature that doesn't jeopardize data during any of these transitions. A package containing the DOS and OS/2 versions of Partition Magic has a retail price of \$129.95. For more information call PowerQuest at (800) 379-2566, (801) 226-8977, fax (801) 226-8941.

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REXX Components

REXX'S SIMPLICITY ALLOWS IT TO COMPLETE COMPLEX TASKS. BY DICK GORAN



It's difficult to digest all of the facilities of a new programming language. REXX has only 26 keyword instructions. Its power lies in the functions that accompany the instruction set. Tables 1 through 4 provide REXX programmers, particularly those who are new to the language, with a concise overview of REXX's functions. Each table contains a logical grouping of the functions by what they do or by the services they provide.

Table 1 contains a list of REXX's 26 keyword instructions. Table 2, the largest of the four, contains a list of the built-in functions. Table 3 contains a list of the external commands that are provided with OS/2 REXX. Finally, Table 4 contains a list of the functions that are contained in the REXXUTIL application programming interface (API) that accompanies OS/2 REXX. At first glance, the limited number of keyword instructions might give the impression that REXX is limited in scope, but the truth is quite to the contrary. The small number of instructions and the large number of built-in functions is one of the reasons powerful REXX programs can be written so quickly and easily.

The built-in functions in Table 2 are divided into logical groups according to what they do. Most of the group names are self-explanatory. However, clarification is warranted on some. The conversion functions provide the ability to convert one type of field to another. The particular conversion is dictated by the key letters B, C, and X (which can

Table 1: Keyword instructions.

ADDRESS	IF - ELSE	NUMERIC FUZZ	RETURN
ARG	INTERPRET	OPTIONS	SAY
CALL	ITERATE	PARSE	SELECT
DO	LEAVE	PROCEDURE	SIGNAL
DROP	NOP	PULL	TRACE
END	NUMERIC DIGITS	PUSH	
EXIT	NUMERIC FORM	QUEUE	

both precede and follow the character 2 in the function name), which represent binary, character, and hexadecimal. The Boolean functions permit individual bits to be used within strings. The Page Manager function is unique and allows REXX programs limited capability in producing graphical dialogue boxes with embedded icons and push-buttons.

The System functions that appear in mixed case in Table 2 are unique to OS/2, but all other built-in functions should be present in other SAA REXX interpreters that are available from IBM.

The REXXUTIL functions that are shown in Table 3 have allowed REXX to become very well integrated with OS/2 and the Workplace Shell. It is the object-related functions that allow REXX programs to create, manipulate, and alter WPS objects on an OS/2 system. The five functions that are marked with an asterisk are new to OS/2 Warp 3.0.

Graphical User Interface (GUI) or

Presentation Manager programming is available with Watcom's VX-REXX, HockWare's VisPro REXX, or Gpf Systems' GPF REXX. In addition, numerous APIs are available as freeware, shareware, or commercial products that further enhance REXX with OS/2. Quercus Systems produces the REXXLIB module and SofTouch Systems distributes the GammaTech SuperSet/2 package. Both commercial offerings provide a wide range of system-related functions, math routines, and file-system functions. Also, the YDBAUTIL group of functions is available free of charge on most popular bulletin boards or you can find it on CompuServe (OS2DF1, Lib 6) as *rxu.zip* and via ftp from Walnut Creek on the Internet (<ftp.cdrom.com:/1/os2/new>) as *rxu17.zip*.

Various specialty APIs can be found on file repositories around the world. Some of the more popular function modules provide asynchronous communications, database

interfaces, high-precision mathematical routines, and some diverse specialty routines.

Using OS/2 Warp's Internet Access Kit, you can surf the net to look for additional REXX APIs—many of which are free. In addition to the other Internet addresses that were listed earlier, the following are known REXX repositories: *rexx.uwaterloo.ca:/pub/freerexx*, *software.watson.com* and *ftp.netcom.com:/pub/dg/dgoran*.

Correction

In last month's column (March 1995, pp. 51-54), we published some incorrect information about one of the five new REXXUTIL functions that were introduced in OS/2 Warp. The error resulted from some ambiguous information that was released by IBM's Glendale Lab, the REXX development group. Definition 1 contains a corrected version of the definition of the **SysSaveObject()** function.

Mystery failures

A fix in OS/2 Warp that was implemented by IBM is subtly causing REXX programs that ran with prior versions of OS/2 to fail. The problem is a lack of file handles in the OS/2 session where the REXX program is running. The default number of file handles (a resource that is required for each open file) is, and has been, 20. Of the 20, 15 are available for user programs and five are reserved for system-related files. When multimedia support was installed, prior to Version 3, it changed the default for the number of file handles from 20 to 80. Apparently, it was done without the kernel developers' knowledge, but IBM deemed it necessary to correct this problem.

The end result is that if you have a REXX program that inadvertently references files with any of the following input/output (I/O) functions: **CHARIN()**, **CHAROUT()**, **CHARS()**, **LINEIN()**, **LINEOUT()**, **LINES()**, or that uses any library functions that do not close all of their files (for example, the **SysGetMessage()** function), it might begin to fail. The only way to prevent it from happening is to increase the number of file handles that are available in the particular session where the program is running, which you can do with the **GrowHandles()** C function. Quercus Systems has implemented this capability in their lat-

Table 2: Built-in functions.

General Purpose	Substr()	I/O
DATE()	TRANSLATE()	CHARIN()
TIME()	VERIFY()	CHAROUT()
Numeric	XRANGE()	CHARS()
ABS()	Words	LINEIN()
DIGITS()	DELWORD()	LINEOUT()
FORMAT()	SUBWORD()	LINES()
MAX()	WORD()	QUEUED()
MIN()	WORDINDEX()	STREAM()
RANDOM()	WORDLENGTH()	System
SIGN()	WORDPOS()	ADDRESS()
String	WORDS()	ARG()
ABBREV()	Conversion	BEEP()
CENTER()	B2X()	ENDLOCAL()
COMPARE()	C2D()	ERRORTEXT()
CONDITION()	C2X()	FORM()
COPIES()	D2C()	FUZZ()
DATATYPE()	D2X()	RxFuncAdd()
DELSTR()	X2B()	RxFuncDrop()
INSERT()	X2C()	RxFuncQuery()
LASTPOS()	X2D()	RXQUEUE()
LEFT()	Boolean	SETLOCAL()
LENGTH()	BITAND()	SOURCELINE()
OVERLAY()	BITOR()	SYMBOL()
POS()	BITXOR()	TRACE()
REVERSE()	File System	TRUNC()
RIGHT()	DIRECTORY()	VALUE()
SPACE()	FILESPEC()	Page Manager
STRIP()		RxMessageBox()

Table 3: REXXUTIL functions.

Screen	SysSearchPath()	SysSetObjectData()
SysCls()	SysTempFileName()	Miscellaneous System Functions
SysCurPos()	WPS Manipulation	SysDropFuncs()
SysCurState()	SysCopyObject()*	SysGetEA()
SysTextScreenRead()	SysCreateObject()	SysGetKey()
SysTextScreenSize()	SysCreateShadow()*	SysGetMessage()
File System	SysDeregister ObjectClass()	SysIni()
SysDriveInfo()	SysDestroyObject()	SysOS2Ver()
SysDriveMap()	SysMoveObject()*	SysPutEA()
SysFileDelete()	SysOpenObject()*	SysSleep()
SysFileSearch()	SysQueryClassList()	SysWaitNamedPipe()
SysFileTree()	SysRegister ObjectClass()	
SysMkDir()	SysSaveObject()*	
SysRmdir()	SysSetIcon()	

* New to OS/2 Warp 3.0.

Definition 1: SysSaveObject()

`SysSaveObject ( object_name, timing )`

Returns 1 if the WPS object **object_name** was successfully saved; otherwise, it returns 0. File system objects (**WPFileSystem**) are saved in the file system's extended attributes and abstract objects are saved in the *os2.ini* (user) file. Transient objects (**WPTransient**) cannot be saved.

Object_name can be a WPS object ID (the unique string preceded with a < and terminated with a >) that is assigned to the object when it is created (for example, <WP_DESK-TOP>) or a fully qualified file name.

Timing_flag can be 0 (Boolean false: object is to be saved synchronously) or 1 (Boolean true: object is to be saved asynchronously).

est version of REXXLIB, a commercial product that is available in a fully functional demonstration from your favorite OS/2 BBS or repository. With the addition of *rexlib.dll*, you can call the **DOS-FILEHANDLES()** function and specify the number of file handles you want for that session. Once the number has been increased, the larger number of file handles remain available to that session until the session is closed.

Dick Goran is the author of the REXX Reference Summary Handbook. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients and lectures on OS/2. He can be reached via e-mail at 71154.2002@CompuServe.com.

Dick Goran will be presenting public three-day REXX classes in Las Vegas beginning March 1995. For more information, call C F S Nevada at (800) 864-2358.

RESOURCES

REXXLIB - OS/2 REXX API (\$20.00 to \$50.00)

Quercus Systems

14500 Big Basin Way, Ste. E

Saratoga, CA 95070

(800) 440-5944

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BBS: (408) 867-7488

CompuServe, PCVENA, Sec 11 (GO CIS:QUERCUS - Charles Daney 75300,2450)

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REXX SuperSet/2 - OS/2 REXX API (\$79.95)

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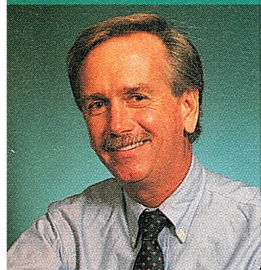
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On-line Services and BBSs for the OS/2 User

SECRETS, SUPPORT, AND SHAREWARE. BY DICK CONKLIN

No matter how you use OS/2, you can benefit from the OS/2 forums on various on-line services and bulletin board systems. Are you looking for a local OS/2 user group? Or, shopping for the latest book on OS/2 Warp? Are you trying to find an elusive device driver or a game for your kids? Your modem is a link to vast libraries of information, help, and soft-

ware that you probably didn't even know existed.

All of the big services—CompuServe, America Online, Prodigy, GENie, Delphi, IBM Talklink, and so on, have active OS/2 forums. Hundreds of local bulletin board systems (BBSs) have OS/2 message sections and file libraries, and some BBSs are completely devoted to OS/2. Most services provide access to

the Internet, Fidonet, and other nets. In fact, the Internet has a growing OS/2 presence and several OS/2 Usenet newsgroups and web servers are attracting OS/2 users.

We don't have room to list every OS/2 on-line file or discussion topic, but we can give you a sampling of things you'll find on some of the most popular on-line services.

Table 1: OS/2 On-line Information and Where to Find it.

Contact Information

Subscription Fees

Software

Top Menu

OS/2 Services

America Online

Call (800) 827-6364 or (703) 448-8700.

\$9.95 per month includes five free hours; each additional hour is \$2.95. 14.4 KBPS maximum.

America Online uses a proprietary Windows interface that can be run under Win-OS/2.

Select OS/2 from the Computing and Software menu or press <Ctrl+K> and type **OS2** into the command box.

Messages, file library, conferences, and Usenet newsgroups.

OS/2 Forum: Free Uploading, Top Picks, Starter Kit, Applications, CMD/REXX, Conference Logs, Demonstrations, Development, Drivers, File/Disk Utilities, Fonts, Games, Graphics & Images, Icons, Motion & Sound, Newsletters, OS/2 1.X, OS/2 Networking, Patches/Fixes, Printer Utilities, Screen Utilities, Shells, Special Utilities, System Tools, Text/Info, Telecommunications, View/Edit, and so on.

BIX

Call (800) 695-4775, (617) 354-4137, or fax (617) 491-6642.

You can subscribe for \$13 per month with an additional connect charge of \$9 per hour during the day and \$3 per hour for evenings and weekends. \$33 per month includes 20 hours with a charge of \$1.80 for each additional hour to be used during evenings and weekends only.

Software

Top Menu

OS/2 Services

BIX can be accessed by any terminal package.

Select Conferences from the main menu and select IBM Exchange *ibm.os2*.

Messages, file library, conferences, and Usenet newsgroups.

Table 1: OS/2 On-line Information and Where to Find it (cont'd).

CompuServe Information Service

Contact Information

Call (800) 524-3388 or (614) 529-1349.

Subscription Fees

\$9.95 per month for unlimited use of more than 100 basic services; \$4.80 per hour for extended services. 14.4 KBPS maximum.

Software

Both Golden Compass (by Creative Systems Programming) and CompuServe Information Manager (CIM for OS/2 by CompuServe) provide OS/2 access. If you don't want a GUI interface, you can access CompuServe by using a terminal package, such as HyperAccess Lite.

Top Menu

GO IBMOS2

OS/2 Services

Messages, file library, conferences, and Usenet newsgroups.

IBM OS/2 Users Forum: (GO OS2USER) The OS/2 Users Forum is a good place for general topics of interest to OS/2 users. You can find OS/2, applications, and information on Team OS/2 and OS/2 user group activities. Most sections focus on technical support problems, for example, OS/2 and Hardware, Application Questions, Documentation, New User Questions, WARP Questions, Internet Access, and Fun and Games. The OS/2 Public Image, PSP/IBM Marketing, Warp Press, and Suggestions sections focus on IBM's marketing and handling of OS/2. The remaining sections, TEAM OS/2, OS/2 User Groups, and Open Forum are for the use of non-IBM OS/2 user organizations.

IBM OS/2 Support Forum: (GO OS2SUPPORT) IBM's OS/2 experts provide support and answer questions on the OS/2 Support forum. The topics include hardware (I/O Media, Platforms, Displays, Printers, and Miscellaneous), programming (WPS/SOM Questions, Extended Services/LAN Server Questions, and REXX/Language Questions), general (DOS Applications, Windows Applications, OS/2 Applications, COMM programs), and Warp-specific (Warp install, Warp Problems, OS2CIM, IBMWorks, Internet IAK).

OS/2 Vendors Forum: (GO OS2AVEN) A forum for companies, including One UP, *OS/2 Magazine*, Sundial Systems, Proportional, Development Technologies, HockWare, Soft and GUI, BocaSoft, Gpf Systems, Softronics, One Tree Software, and Arcadia Tech. Other companies are also represented in Section 1, the Other Vendors forum.

OS/2 B Vendor Forum: (GO OS2BVEN) Sections for companies include PCX, SCA, and SIO Support, Carry Associates, MSR Development, ISS, Pro Engineering, and SofTouch Systems. Section one is the official OS/2 Shareware forum where many shareware vendors post and support their shareware programs.

IBM PSP A Products Forum: (GO PSPAPROD) IBM supports some of its OS/2 software and hardware products in this forum, including Person to Person, CICS OS/2, RouteXpander/2, LAN Server, IBM Speech Products, LAN Distance, and Network Door/2.

OS/2 Developers 1 Forum: (GO OS2DF1) Includes Base OS API's, PM API's, 2.x Workplace Shell, IBM C SET, IBM C Class, REXX/Other Language, Development Tools, Debugging, 16 to 2-bit Thunking, OS Migration, device-driver development, MMPM/2 - Multimedia, Developer's Documentation, OpenDoc for OS/2, and product suggestions.

OS/2 Developers 2 Forum: (GO OS2DF2) Includes Communications Manager, LAN Server, NTS/2 - Transport, TCP/IP, CID Enablement, PEN Software, Installer and DA/2, SPM/2 - Performance, LAN NetView, DCE-OSF/DCE on OS/2, Developer's Connection*, *OS/2 Developer Magazine*, DAP*, and Product Suggestions.

Other forums of interest:

(GO NOVOS2) Novell's OS/2 forum supports the OS/2 network requester.

(GO COMPASS) Golden CommPass Forum talks about the CompuServe off-line navigator.

(GO OCIMSU) OS/2 CompuServe's Information Manager Support.

(GO PSPBETA) IBM PSP Beta Forum tells what IBM is testing.

(GO BCPPWIN) Borland C++ for Windows and OS/2.

(GO PCVENA) PC Vendors A Forum; DeScribe product support.

(GO PCVENB) PC Vendors B Forum; JP Software product support.

(GO PCVENF) PC Vendors F Forum; Hilgraeve product support.

(GO LOTUS) Support of many Lotus OS/2 products.

* Open to enrolled members

Table 1: OS/2 On-line Information and Where to Find it (cont'd).

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Contact Information Subscription Fees Software Top Menu OS/2 Services	GENIE Call (800) 638-9636, or for Canada: (800) 638-9636. On-line enrollment (modem): (800) 638-8369 or for Canada: (800) 387-8330. Set modem for local echo; press HHH; U#=SIGNUP. \$8.95 includes four hours; \$3 for non prime-time hours; \$9.50 for prime time (8am - 6 pm) hours. 2400 BPS maximum. You can use generic communications software; Aladdin access software (DOS) can be downloaded, but no OS/2 version is available. Enter OS/2 at command prompt for OS/2 Roundtable. OS/2 Forums/Bulletin Boards: General OS/2 Questions, The Soap Box, Magic Carpet - OS/2 FE for GENIE, OS/2 Users, Installation, desktop publishing, hardware, shells and UIs, operation, connectivity, word processing, other applications, spreadsheets, multimedia, graphics, product support, communications, OS/2 development general questions, PM and WPS (Win, GPI, and SOM), graphics functions, printing functions, and programming Tools. OS/2 Software Library: Includes library utilities, editors, games, multimedia, device drivers, IBM PSP communication, communications applications, database, beta software; IBM employee-written spreadsheets, commercial, file and disk management, PM applications and utilities, support files, WPS utilities, INF documents and text, text-mode applications, and utilities, compilers, interpreters, REXX, OS/2 2.0 Service Pak, graphics, UNIX utilities for OS/2, IBM fixes and patches, commercial demonstration programs Other OS/2 Information/Support: Roundtable News, OS/2 real-time conferences, OS/2 games, OS/2 help desk, Team OS/2 meetings.
Contact information Subscription fees Top Menu Software OS/2 Services	Prodigy Interactive Service Call (800) 776-3449 or (914) 448-8000. \$9.95 or \$14.95 per month includes free time on some services. Additional time is \$2.95 per hour. 9600 BPS maximum. [JUMP] OS/2 Club Prodigy has only DOS and Windows versions of their proprietary terminal software. However, they announced that they will be releasing an OS/2 version in conjunction with the release of Warp by mid-1995. Messages, file Libraries, and conferences. The Answer Bank contains a list of frequently-asked questions (FAQs) about OS/2. The Download Library offers shareware from IBM and others. You can submit an OS/2 problem report in the OS/2 Exchange. The OS/2 Bulletin Board offers beta feedback, BonusPaks, communications-modem, DOS applications, general questions, hardware and other, installation, LAN, marketing, multimedia/CD-ROM, new user, open discussion, OS/2 club discussion, OS/2 applications, printing, programming and REXX, ServicePaks, suggestions, Team OS/2, Windows applications, video/graphics, and OS/2 Warp.

Usenet Newsgroups

The Usenet is the Internet's collection of forums or bulletin boards that can be accessed from many on-line services and Internet nodes. Contact your on-line service to find out if you have access.

If you are reading the newsgroups through any of the services listed, you'll be using their software. But, if you're connecting to the Internet with the Internet Access Kit or TCP/IP, you'll need a news reader, for example NewsReader/2 which is included with OS/2 Warp.

comp.binaries.os2	Binaries for use under the OS/2 API. (Moderated)	comp.os.os2.multimedia	Multi-media on OS/2 systems.
comp.os.os2.advocacy	Supporting and flaming OS/2.	comp.os.os2.networking.misc	Miscellaneous networking issues of OS/2.
comp.os.os2.announce	Notable news and announcements related to OS/2. (Moderated)	comp.os.os2.networking.tcp-ip	TCP/IP under OS/2.
comp.os.os2.applications	Discussions of applications under OS/2.	comp.os.os2.programmer.misc	Programming OS/2 machines.
comp.os.os2.beta	All aspects of beta releases of OS/2 systems software.	comp.os.os2.programmer.oop	Programming system objects (SOM, WPS, etc).
comp.os.os2.bugs	OS/2 system bug reports, fixes and work-arounds.	comp.os.os2.programmer.porting	Porting software to OS/2 machines.
comp.os.os2.games	Running games under OS/2.	comp.os.os2.programmer.tools	Compilers, assemblers, interpreters under OS/2.
comp.os.os2.misc	Miscellaneous topics about the OS/2 system.	comp.os.os2.setup	Installing and configuring OS/2 systems.

Dick Conklin is a contributing editor to OS/2 Magazine and author of three OS/2 books. He can be reached at CompuServe 76711,1005 or Internet os2mag@vnet.ibm.com.

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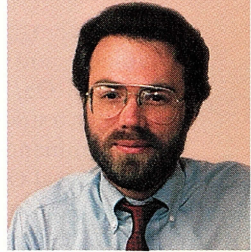
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Exploring Program Objects

**DID YOU ACCIDENTALLY DELETE YOUR
COMMAND PROMPTS FOLDER?** BY MARK MINASI



Last month, we examined objects—in particular, folder objects under the Workplace Shell. In this month's column, we'll look at program objects.

Programs under OS/2 are, similar to programs under DOS, Windows, or NT, files that contain machine language programs. They are identifiable by the fact that they have a .com or .exe extension. Originally, .com and .exe files were extensions for different types of program files. That has, however, changed over the years; .com and .exe are now interchangeable file extensions.

To start a program, find its .exe or .com file in a drive folder and double-click on it. OS/2 will recognize that it is a program file and automatically load and execute the .exe or .com file. In fact, because program files have distinctive header information, OS/2 can detect whether the file is a DOS, Windows, OS/2 1.x, or OS/2 2.x/Warp program file. That's why the .exe extension works for NT files, OS/2 files, DOS, and Windows files without confusing those operating systems. It is also why you get an error message instead of a system crash when you try to run an OS/2 program under DOS.

If you found an .exe file by poking around in a drive folder, you didn't find a program object. What you found is the data-file object that corresponds to the .exe file. If you open the Settings Notebook for the program, you will see that it has the tabs: Program, Session, Association, Type, Menu, File, and

**Because
program files have
distinctive header
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OS/2 1.x, or OS/2
2.x/Warp program file.**

General. If you look in the OS/2 folder, you will find a file called *e.exe*, the OS/2 System Editor.

It would be inconvenient if you had to drill down through the Drives folder every time you wanted to run a program. Fortunately, the OS/2 desktop includes program objects. A program object is a small bit of information that points to an executable file. It allows you to instruct OS/2 to run a program in a window or as a full-screen program. If the program is a DOS program, OS/2 keeps the DOS settings for that program in the program object. You can assign new icons, titles, or anything else you normally do with an object.

Why use program objects? Why not

simply create shadows of program files and put the shadows conveniently into folders? If you read this column regularly, you'll recall that I spent several months going through all of the DOS settings. Some of those settings don't have right or wrong values, except when you use the program in a particular way. One very important DOS setting is `DOS_BACKGROUND_EXECUTION`, which governs whether or not DOS programs run in the background under OS/2.

What's the right value for background execution? Should DOS programs run in the background or not? The answer is, it depends. Suppose, for example, you were running WordPerfect 5.1 under OS/2. If you wanted to use WordPerfect to edit, you'd turn off the background execution option. You can't edit while the program is in the background and you wouldn't want to waste CPU time on WordPerfect. If, however, you were printing from WordPerfect, enabling background execution would make perfect sense because you could then print in the background. The beauty of program objects is that you can use two program objects to refer to the same program, so you'd create two WordPerfect objects—one with execution in the background and one without.

Compare a program object to a corresponding data-file object by examining the OS/2 System Editor object in the Productivity folder (it's in the OS/2 System folder). You'll notice that it

In an OS/2

ACCIDENTALLY DELETED HER COMMAND FOLDER.

CLASS I WAS TEACHING RECENTLY, A STUDENT

only has Program, Session, Association, Window, and General tabs.

In an OS/2 class I was teaching recently, a student accidentally deleted her Command Prompts folder. People in the local OS/2 support group suggested that we reload the Command Prompts folder from a desktop backup. But, it's not hard to build something like the Command Prompts folder. If you wanted to create a folder called Replacement Prompts that contained all of the various prompts that were deleted and, just for variety's sake, the Program Manager and the foundation of Windows 3.1 so you could easily run seamless Windows programs (assume, for this exercise, that you have Windows in a directory called `c:\windows`), you would do as follows:

- Open up the Templates folder. You'll see a template labeled Folder. Using the right mouse button, drag it out onto the Desktop. Notice that when you do that, the original Folder object remains in the Templates folder. That's because it is a template, which is a special kind of object. You'll now see a folder on your Desktop named Folder.
- You probably know how to rename the folder, but for those who haven't yet given a title to an object, we'll run through it. Right-click on the new folder to bring up its pop-up menu and select Settings. You can also bring up its pop-up menu by clicking on the folder and pressing `<Alt+Enter>`. The notebook will appear. I am assuming that you're using OS/2 Warp. If you aren't, getting to the Settings notebook is somewhat more complex. Right-click on the folder to raise the pop-up menu and click inside the little button that has a right arrow on its face. That is the Open option on the

pop-up, which will display a sub-menu that contains Settings, which you should select.

- Once the Settings notebook is opened for the folder that is currently named Folder, click the General tab. You'll see a field named Title:, which contains the word Folder. Change Folder to Replacement Prompts and close the Settings notebook.

I usually get a flood of e-mail whenever I miss something, so I will mention that you can rename the folder another way. Click on the folder and press `<Shift+F9>`. The Folder label will change color, which indicates that you can edit it. When you're finished editing, do not press `<Enter>`, because that will only insert carriage returns in the title. Instead, click somewhere else on the Desktop to end the rename operation or press the gray `<Enter>` key on the keyboard.

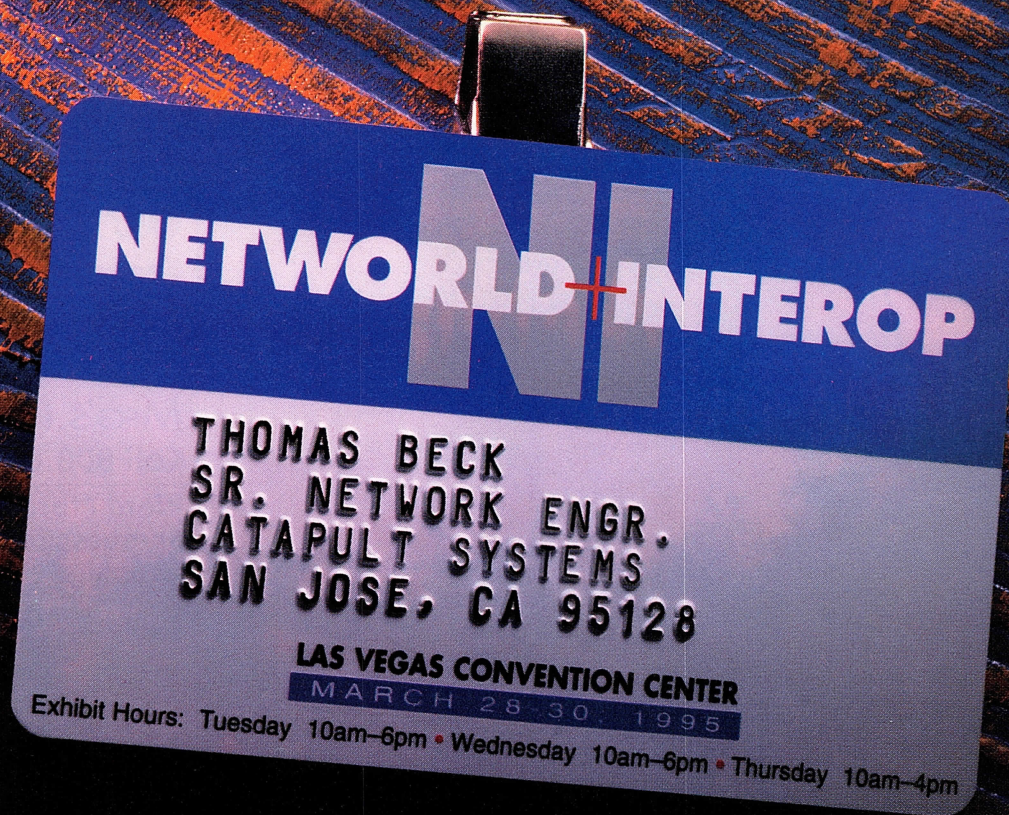
- Drag the Program template from the Templates folder, dropping it in the Replacement Prompts folder. A Settings notebook will appear. In the Path and File Name field, type an asterisk. Click the Session tab and make sure that the OS/2 Window radio button is selected. In the General tab, you can give this program object any name. Close the notebook. The object is now ready, sitting in the Replacement Prompts folder.
- Now that we have one object in our folder, we don't need to use templates anymore. Reopen the Replacement Prompts folder and right-click on the OS/2 Window object that you already created. When the object menu comes up, click once on

Create Another. You'll see a window with Replacement Prompts - Create Another in the titlebar. Highlight the word program, type `OS/2 Full Screen`, and double-click on the Replacement Prompts folder. The settings window for your new object should open. Insert an asterisk in the Path and File Name field, but this time, on the Session page of the Notebook, select `OS/2 Full Screen`. You now have a new OS/2 full-screen prompt. Repeat this procedure to recreate your DOS Full Screen, DOS Window, and Win-OS/2 Full-Screen prompts. The only difference is that you'll select different session types for the corresponding prompts.

- Finally, we'll create a Program Manager (or seamless Win-OS/2) object. Use Create Another or a program template method to create a new object in the Replacement Prompts folder. When its Settings Notebook comes up, fill the Path and File Name: field with `c:\windows\progman.exe`. Again, in this example, you're running the actual Program Manager that ships with Windows, not an OS/2 program. Click the Session tab and you'll see that all of the radio buttons have been grayed out except for Win-OS/2 Full Screen and Win-OS/2 window. We want to run this session seamless, so click on Win-OS/2 window and close the Notebook.

You can now recreate most of the program objects. Please note that some programs, for example DevTech's `DeskMan/2` and Lotus' `cc:Mail for OS/2`, don't use traditional methods to create their program objects, so you might have to reinstall.

Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for Compute, BYTE, and OS/2 Magazine. You can contact him at CompuServe 71571,264 or Internet mminasi@access.digex.net.



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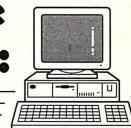
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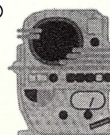
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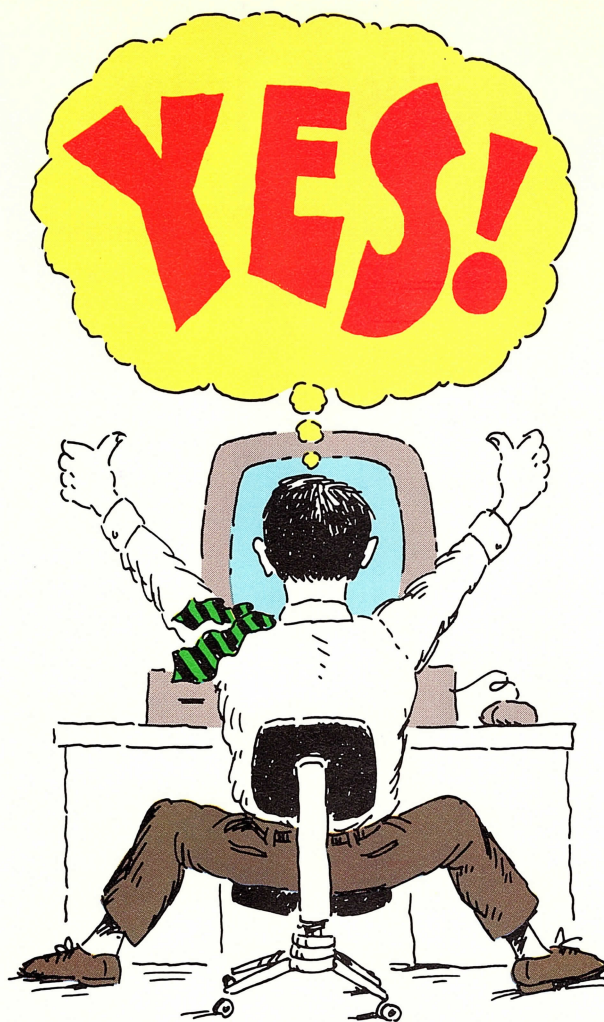
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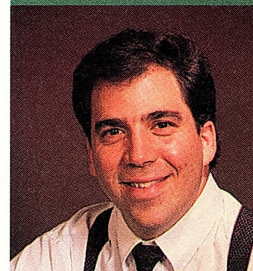
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More Warp Factors

FIXING PRINTERS, OVERCOMING C: BIAS, ASPI, ATI WONDER, WARP UPGRADE STRATEGIES, AND SMP. BY DAVID REICH



NEW ANIMATED ICONS

Q: I would like to change the animated icons for some of the objects on my desktop. I have the new icons for the closed and open icons, but how do I make them active for a folder?

A: The animated icons are a new feature introduced with OS/2 Warp. You will also find a new Settings Notebook page that you can use to set them up. Animated icons aren't actually animated; one icon indicates that an object is closed, and another indicates that it is open. To animate an object's icon, all you have to do is set these two icons in the Object Settings.

The first step is to bring up the Context menu for an object by clicking on it with mouse-button two. On the Context menu, select the Settings menu item to open the Settings Notebook. On the Settings Notebook, select the General page. You are now ready to change the icons.

Leaving the Settings Notebook open, select the Drives folder and open the drive that contains the new icons by double-clicking on it. Traverse through this drive until you get to the folder (subdirectory) that contains the icons you want to change. You will see the Settings Notebook in one window and the folder with your new icons in another.

Grab and drag the closed-state icon to the icon window on the General page using mouse-button two and drop it. Click on the right arrow in the lower-right portion of the page and you will see the second part of the General page,

Some applications put files in the root directory as well as application subdirectories. Make sure you poke around the root drive for any other stray files before considering the job finished.

which shows the open-state icon. Again, using mouse-button two, grab the open-state icon from the folder and drag and drop it onto this page. Close the Settings Notebook and you're done.

If you don't already have the new icons, you can create them by using the Icon Editor application included with OS/2 Warp.

FIXING PRINTING

Q: I have been running OS/2 for a few years and have never had any problems with it. Since I installed OS/2 Warp, I have not been able to print. Besides loading OS/2 Warp, I've changed nothing in my hardware or software. Help!

A: Changes were made to the parallel-port driver in OS/2 Warp to improve printing performance. Fundamental changes have been made to the way

this port device driver (*print01.sys*) operates. Some models of printers or parallel-port hardware can have timing inconsistencies that might prevent them from working properly with this new driver. You can, however, easily fix the problem.

Bring up the system editor and edit the *config.sys* file, which you should find in the root directory of the boot drive. Look for the line that has *print01.sys* in it. At the end of that line, add */IRQ* at the end, so it reads:

```
BASEDEV=PRINT01.SYS /IRQ
```

Now, save the changed file. This change will become effective when you shut down and reboot your system. */IRQ* tells the device driver to operate the way it used to in prior OS/2 versions.

INSISTING ON C:

Q: I have some programs that insist on installing all, or parts of themselves, onto my boot drive (mine is drive c:). I have heard that it's better to keep the operating system on the boot drive and put everything else on other drives. How can I do this if some programs insist on installing themselves onto c: ? One of the major applications that tries to install onto c: is OS/2 LAN Server.

A: Most applications that insist on installing to your boot drive don't really need to be there. These applications may make some changes to your *os2.ini* file, but that doesn't mean they must be installed on your boot drive.

If you are using a program that fails

to offer a choice of installation destinations, try moving it after you've installed it. Remember that when moving a whole program you must move every file in every directory, change the appropriate *config.sys* statements, and, most importantly, keep an accurate record of what you are doing so that if it does not work, you can restore it to the way it was before you made these changes. If it does work, you can just leave it alone.

My system is set up so that I keep a backup of *config.sys* and other critical files and a backup of my desktop architecture. Whenever I install a new version of OS/2, I can freely format the boot partition, install, and restore these critical system files. (For major OS/2 version updates, I often have to manually make changes to *config.sys*, merging the old information with the new if there were major architectural changes in *config.sys*.)

Let's use the OS/2 LAN program as an example. Even though it allowed you to choose an installation drive for parts, you may have accidentally installed it on the boot drive. Make a backup copy of *config.sys*, edit the active *config.sys*, and find all references to the LAN code. I usually make a backup copy of my *config.sys* before I install a software product, so I can compare it to what it looks like afterwards. This way, I can tell what the software installation added.

For all references to the LAN software on your boot drive, change the drive letter reference to the desired drive (the drive you will be moving the software to). Since you also know where the software was installed (in what directories) on the boot drive, you know which directories to move.

Now that you've made the changes to *config.sys* (if any needed to be made), you can start moving the executable and support files. Record all of the directories on the source drive you need to move. Hopefully, the application you are moving installed its files under only one subdirectory. In the case of the OS/2 LAN software, several subdirectories are created under the root. You will need to move the files in each subdirectory individually. I usual-

ly use the XCOPY program, specifying the parameters to copy any and all files, regardless of attributes.

For example, if I want to move the \ibmcom directory from the c: drive to the d: drive, I will use the following command:

```
XCOPY C:\IBMCOM\*.* D:\IBMCOM
/S /E /V /H /R /O /T
```

I will leave you to read the documentation for explanations of each of those options. This command copies all files from c:\ibmcom to d:\ibmcom, regardless of whether or not the file has hidden attributes. In addition, it will copy all subdirectories under \ibmcom. Once you have completed copying, you can delete the source directory.

I rename the original directories on the source drive instead of deleting them and keep them until I am sure that the reconfiguration is complete and that it works. That way, I don't have to copy the files back if the program actually needs to run from the boot drive. To rename a directory, use the REN command the same way you would rename a file. This way, the files on the root drive, as well as the changes to *config.sys*, won't accidentally be found by the PATH or LIBPATH statements.

You should also be aware that some applications put files in the root directory as well as application subdirectories. Make sure you poke around the root drive for any other stray files before considering the job finished.

Once you have copied all files and renamed the source directories, you will be ready to reboot and try it out. If you updated all of the affected *config.sys* entries properly and remembered to copy all files and directories, the application should come up perfectly after you reboot. After testing the configuration, you can remove the directories you left renamed on the boot drive.

ASPI SUPPORT

Q: I have a backup program from Central Point software that requires

ASPI support. Does OS/2 have ASPI support for DOS Sessions? I have seen *os2aspi.dmd*, but even when I put the line:

```
BASEDEV = OS2ASPI.DMD
```

in my *config.sys* file, the program refuses to run. What can I do?

A: DOS sessions cannot make use of the OS/2 drivers for system services. They require the use of virtual drivers for system services. That is why, when you look through your *config.sys* file, you will see driver counterparts with a v in front, which signifies that it is the virtual driver. A good example is *com.sys* and *vcom.sys*.

To ensure that ASPI support for DOS applications is enabled, add the following line to your *config.sys* file:

```
DEVICE = x:\OS2\MDOS\VASPI.SYS
```

X is the drive where OS/2 is installed. Reboot your system and your backup program should work just fine.

One other tip about the Central Point backup program is: be sure to check the WinASPI option or you may get a General Protection Fault (GPF) on the Windows version of this program.

ATI VGA WONDER

Q: I'm using the ATI VGA Wonder with 1MB memory. Under DOS/Windows, I can use the card at 640x480x32K colors without any problems. When I installed OS/2 Warp, it found the card but will only let me recognize 640x480x256. The card is capable of 800x600 and 1,024x768. What can I do to make OS/2 Warp allow other resolutions?

A: Copy the program *svga.exe* from the \os2 directory on the boot drive to a disk (or to a FAT drive on the system if you have one). Boot real DOS (not a VDM) and run the program by typing: *svga on dos* and pressing <Enter>. This line will generate a file called *svga-data.dos*. Rename this file to *svgadata.pmi*, reboot to OS/2, and copy this file to the \os2 directory on the

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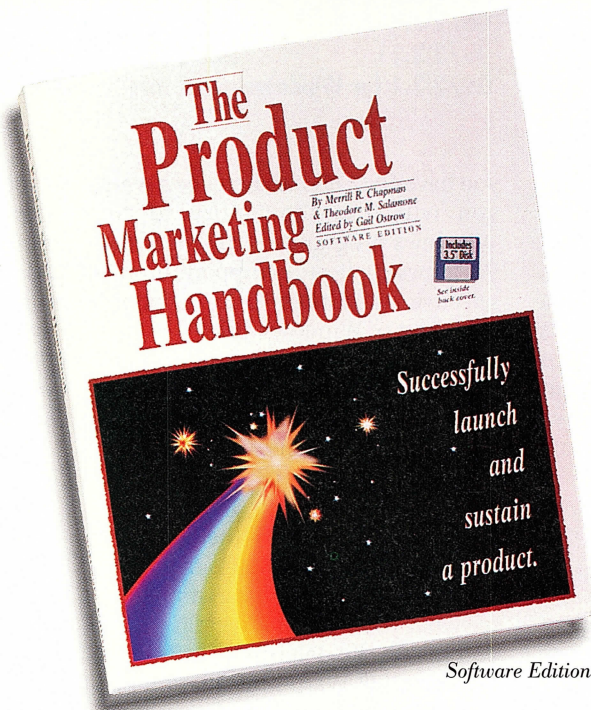
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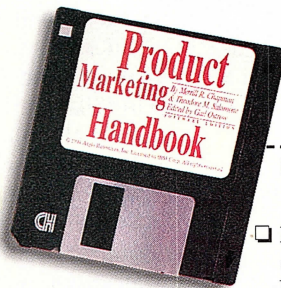
Merrill R. Chapman has been in the software industry for 15 years and has seen firsthand the brilliant marketing techniques employed by industry giants and the catastrophic errors made by companies that are no longer in business. He presently consults with and trains marketing professionals in companies that include IBM, DataEase, SUN, Berlitz and WordPerfect.



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boot drive. Reboot your system and you will be able to use the system utilities to set it to your desired resolution.

INSTALLING OS/2 WARP FLAVORS

Q: I presently have OS/2 2.11 installed on my system. I have the Microsoft Windows disks and would like to install the version of OS/2 Warp without Win-OS/2 so I can use the existing Windows configuration that I keep on another drive. I've heard that OS/2 Warp will not install on an OS/2 2.1 or 2.11 system unless it has OS/2 for Windows. I also have a friend who has OS/2 for Windows who wants to install the version of OS/2 Warp that has Win-OS/2. What combinations of OS/2 Warp can we install?

A: IBM designed the installation programs for the two basic types of OS/2 Warp (with and without Win-OS/2) to protect users from accidentally installing the wrong version on top of another. For example, if you had OS/2 2.1 and installed OS/2 Warp (the version without Win-OS/2), unless you had a set of Windows disks, you would lose the ability to run applications written for Windows. The installation programs only let you install a like version, unless you want to format the drive during installation. Formatting the drive, however, will erase your previous configuration and customization.

Table 1 shows what combinations are designed as the upgrade path to OS/2 Warp.

If you have one type of OS/2 installed and want to upgrade to the other (such as, if you have OS/2 for Windows and want OS/2 Warp with Windows), you can do it, although it is not supported by IBM.

If you plan to format your drive, you don't need to go through these steps, but if you want to install the other type of OS/2 Warp and keep your current configuration, you can do so by installing without formatting the drive. You need to be aware that if you do, you may need to do some extra work on your configuration. For example, if

Table 1: OS/2 Warp Upgrade Combinations.

If you have:	You should upgrade to:
OS/2 1.x	OS/2 Warp "full pack"
OS/2 2.0	OS/2 Warp "full pack"
OS/2 2.1	OS/2 Warp "full pack"
OS/2 2.11	OS/2 Warp "full pack"
OS/2 2.1 for Windows	OS/2 Warp "for Windows"

you have OS/2 2.11 and get OS/2 Warp, you will lose the ability to run Windows programs until you install Windows application support through selective installation. To do so, you will need a set of Windows disks.

Since OS/2's installation program will not let you install one flavor of OS/2 over the other (for example, one has Win-OS/2 and the other is OS/2 for Windows), you must delete the *syslevel.os2* file. This file lives in the *\os2\install* directory of the boot drive and contains the version information that the installation program uses to see what you have and what it will let you install. By deleting this file, you prevent OS/2 Warp's installation program from knowing which version of OS/2 you have, so it will let you install without formatting the drive.

You need to be aware that you might lose functions by doing this, and the installation program may not clean up all of the old files from previous OS/2 versions, so you may have to do some minor tweaking of this configuration. Although it works, if you encounter problems, this method of installation is not covered by IBM.

SMP

Q: What is the difference between OS/2 and OS/2 SMP? Will my applications run under OS/2 SMP and what will I see? Will they run faster or slower and do I have to do anything to make all of it work together?

A: OS/2 SMP is OS/2 for Symmetric Multiprocessor machines. These machines have several processors (CPUs) that work closely together. For example, on a machine with two

processors, one thread of an application can be running on one processor while another thread of the same application can be running on the other. It is called tightly-coupled, or symmetric, multiprocessing. OS/2 SMP is, basically, OS/2 enabled to take advantage of the multiple processors in an SMP machine.

You don't need to do anything special to run your applications on OS/2 SMP and your OS/2, DOS, and Windows applications should run as they do with the off-the-shelf version of OS/2.

The better threaded an application is, the more it will be able to take advantage of OS/2 SMP. For example, a single-threaded program, whether it is a DOS, Windows, or single-threaded OS/2 application, will run with identical performance under OS/2 SMP as it would under other OS/2 versions, since a single-threaded program will be dispatched to one processor, whether you have one, two, eight, or more processors.

Applications with multiple threads will perform better on SMP machines with OS/2 than on a single-processor system, because different parts of the application will execute physically concurrently, instead of preemptively time sliced on a single processor. The better threaded the application is, the more scalability in performance you will see on SMP systems.

David Reich, a contributing editor to OS/2 Magazine and author of Designing OS/2 Applications, has been with the OS/2 development team since 1987. David is interested in your questions and suggestions. Contact him at CompuServe 76711,632 or Internet speedracer@vnet.ibm.com.

bleshooting guide (Chapter 22) is a *tour de force* that will surely repay your \$39.99 (call it \$40.00 if your Intel microprocessor has an integral FPU). The price includes a CD ROM stuffed with the usual shareware goodies. My preview copy came without the CD ROM, so I cannot judge its value. The now-mandatory historical Chapter 1, "OS/2 Background," is a tad messy, but no more messy than the unfolding facts. We are taken through the familiar Intel 80x86 architectural horrors (recall the 80286?) and the agonies of the IBM/Microsoft operating-systems collaboration via depressing headings, such as "Looking Back to 1986: Early Disappointments." Sadly, I suppose, this background is essential for OS/2 competence, if not in the detail then at least in the gist. The book continues with a "Seeing Where OS/2 Is Headed" section, discussing Taligent, OpenDoc,

and the PowerPC. Again, I feel that these "future" topics are meet for the target audience. If you want to remain an "experienced PC user," you must keep up with these emerging trends, although computer books react far too slowly.

As a founding member of the Apostrophe Defense League (ADL), I must admit that I suffered mortal pangs within the first few pages of *Inside OS/2 Warp, Version 3*. Emmett Delaney, NRP's Product Director, opens the book breezily with "...OS/2 Warp has made it's debut." Pausing but three weeks to recover from this shock, I then progressed to page viii where I found "...and Rob Lawson, Team Leader /Production Editor, who's help and encouragement were greatly appreciated." My double-take is that these solecisms were deliberately retained. Real programmers don't dig gooder grammer.

Stan Kelly-Bootle started computing on EDSAC I at Cambridge over 40 years ago and has written at least 11 books. His "Devil's Advocate" column in UNIX Review has been running since 1984. His new book, *The Computer Contradiction*, will appear in the MIT Press Spring 1995 catalog. He welcomes e-mail via CompuServe 70323,1560 or Internet skb@crl.com.

RESOURCE

Inside OS/2 Warp, Version 3 (\$39.95, including CD ROM)

by Mark Minasi, Bill Camarda, Bruce Hallberg, Cynthia Ross-Pedersen, David Both, Stephen A. Gutknecht, Leslie L. Lesnick, Andrew Dahl, and Bill Stevens.
New Riders Publishing, Indianapolis, Indiana, 1995
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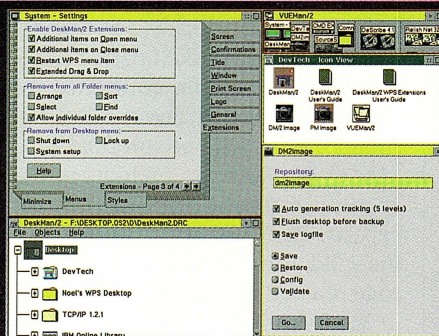
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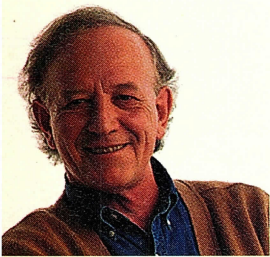
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Niech Żyje Osnowa Tkacka! Long Live Warp!

INSIDE OS/2 WARP, VERSION 3 BY STAN KELLY-BOOTLE

IBM's megabuck OS/2 promotion is building up nicely with OS/2 Warp 3.0 sales passing, as I write, the one-million mark. My French-Polish wife was especially thrilled by IBM's brilliant multilingual TV campaign. In one advertisement, we see two grizzled *paysans* strolling on the banks of the Loire, discussing, with risible subtitles, their hard-disk capacity problems. In another episode, we follow a fetching group of Polish nuns as they stride through their ancient cloisters. They bemoan the delays in Microsoft's Chicago and extol the here-and-now multitasking joys of OS/2 Warp until pre-empted by an interrupt from the Mother Superior's beeper.

Predictably, computer-book publishers are rushing to exploit IBM's coverage with a matching tsunami of new and revised OS/2 books. Last month, I reviewed the first OS/2 Warp-updated offering, *Running Windows Applications in OS/2—A Power User's Guide*, from Van Nostrand Reinhold. Now, close on its heels comes the first specific OS/2 Warp book, *Inside OS/2 Warp, Version 3*, by Mark Minasi et al., from New Riders Publishing (NRP)—yet another of Macmillan's far-flung colonies upon which the sun never sets. NRP's quick-to-market tactic follows the old parallel-authorship trick, but here it is played in spades. The nine authors listed are possibly worthy of a Guinness Record citation if you exclude, say, the 750 co-authors of the *Anchor Bible Dictionary*. Apart from Chapter 7 (wrongly called Chapter 5 in the Credits—hints of a last-minute dash?), which is attributed to Cynthia Ross-

Inside OS/2 Warp, Version 3 is openly aimed at “experienced PC users,” thereby avoiding most of those boring “dummy” landfill pagifications.

Pederson, we are not told who did what and when to whom—safety in numbers? But, because the co-authors are not listed alphabetically, I assume that the first-named, Mark Minasi, esteemed fellow *OS/2 Magazine* columnist, was the *maine begetter*. In any case, his eight collaborators, who are profiled in the “About the Authors” prelude, provide an impressive gathering of OS/2 experts. Throughout, the book reflects the solid, intimate *nuts 'n bolts* knowledge of OS/2 that is regularly revealed in Mark Minasi's “Under the Hood” columns.

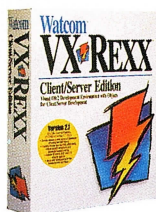
Let me say at once that *Inside OS/2 Warp, Version 3* looks like a surefire winner in the Warp book stakes. It's a massive, kilopage tome designed to serve as both tutorial and reference. Success in this tricky genre depends heavily on diverse factors, not only the technical authority, but physical, typographical, and indexing factors. On all these fronts, NRP has excelled. In spite

of its size, the book stays flat amid your desktop mess at the opened target page. Furthermore, the book is commendably two-tone readable. Text and screen-shots are legibly interspersed with bold intelligent titling and generous white space. Part V (the Command Reference) is visibly offset with a mottled blue margin. I have one minor quibble: the adjacent index pages have a solid blue edge that is not sufficiently distinct for rapid access.

Moving to the technical contents, this book scores highly over its earliest competitors in two areas. First, it covers the BonusPak in greater detail, including outstanding chapters on FaxWorks, HyperACCESS Lite, TCP/IP, and Internet connectivity. Second, a whole new life-changing “Map Your Future” section (Appendix A) is devoted to the IBM OS/2 and LAN Server Professional Certification Programs. And, lest you dare confuse software with cornflake marketing, the book contains a 40-percent discount request voucher that is valid for one certification test fee! Bookstore browsers should make sure that p. 883 is *in situ* before buying. Incidentally, the flimsy paper discount coupon, with an obverse prepaid business reply, is hardly consistent with the cut-out instruction: “By returning this card...”

Inside OS/2 Warp, Version 3 is openly aimed at “experienced PC users,” thereby avoiding most of those boring “dummy” landfill pagifications. By following the introductory pointers, you can take the “new-to-OS/2” or “new-to-Warp” threads through the book. The extensive (more than 100 pages) trou-

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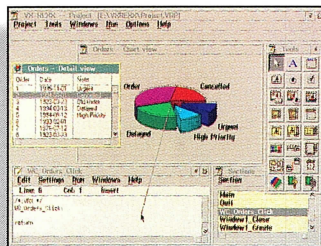
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